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WEST COAST *SPECIAL*

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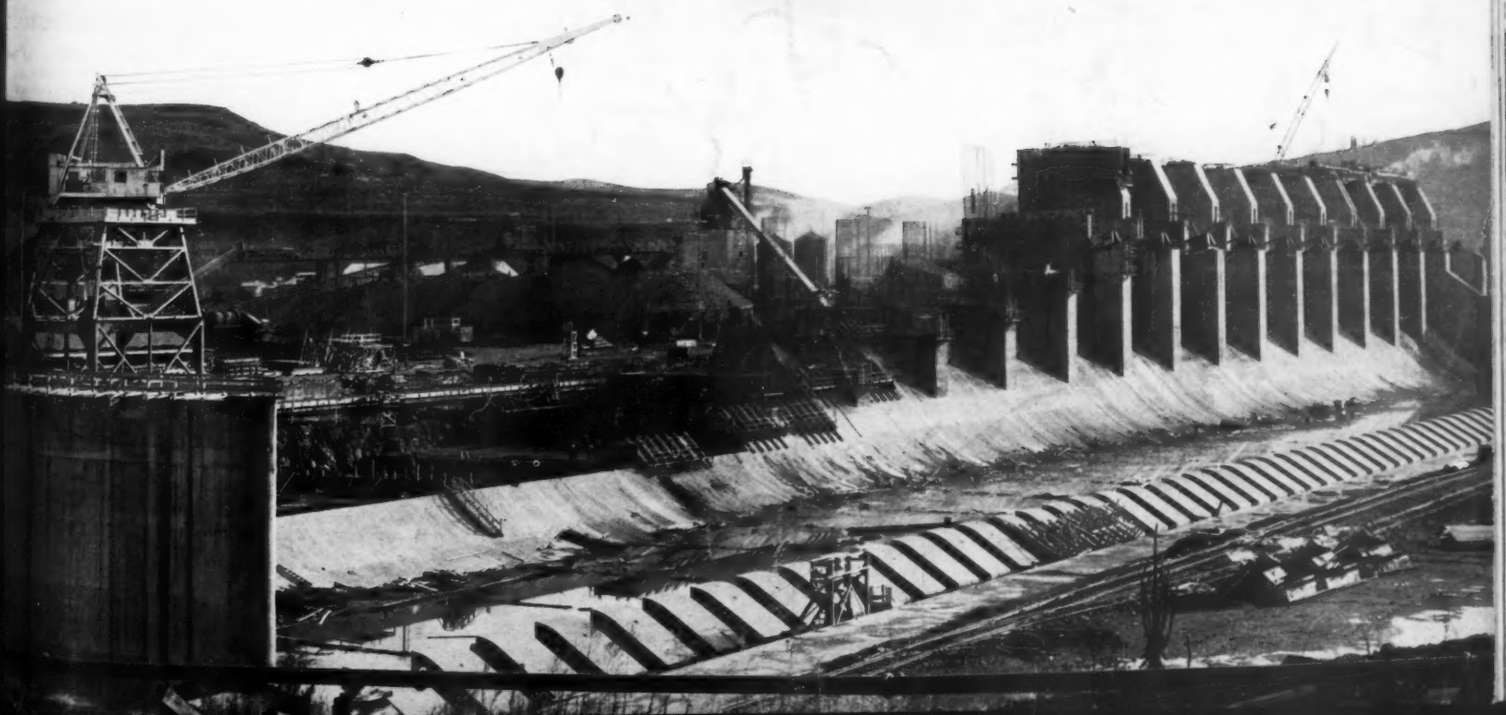
APRIL 1955

Contractors and Engineers

magazine of modern construction

Two jobs illustrate the size and variety of West Coast construction. Above, a dual-boom American traveler erects steel on the Richmond-San Rafael Bridge across San Francisco Bay. *Page 5.* Below, The Dalles Dam spillway on the Columbia River in Oregon. *Page 24.*



How To Get Better Quality Concrete With Varied Job Conditions

Although materials and conditions vary from job to job, better quality concrete is a constant when Pozzolith is used. A good example is the experience on the garage job described below.

The basic difference in the three formulations of Pozzolith pertains to setting time requirements, and to those properties that are related directly or indirectly to setting time. With all three formulations, however, the following benefits are obtained:

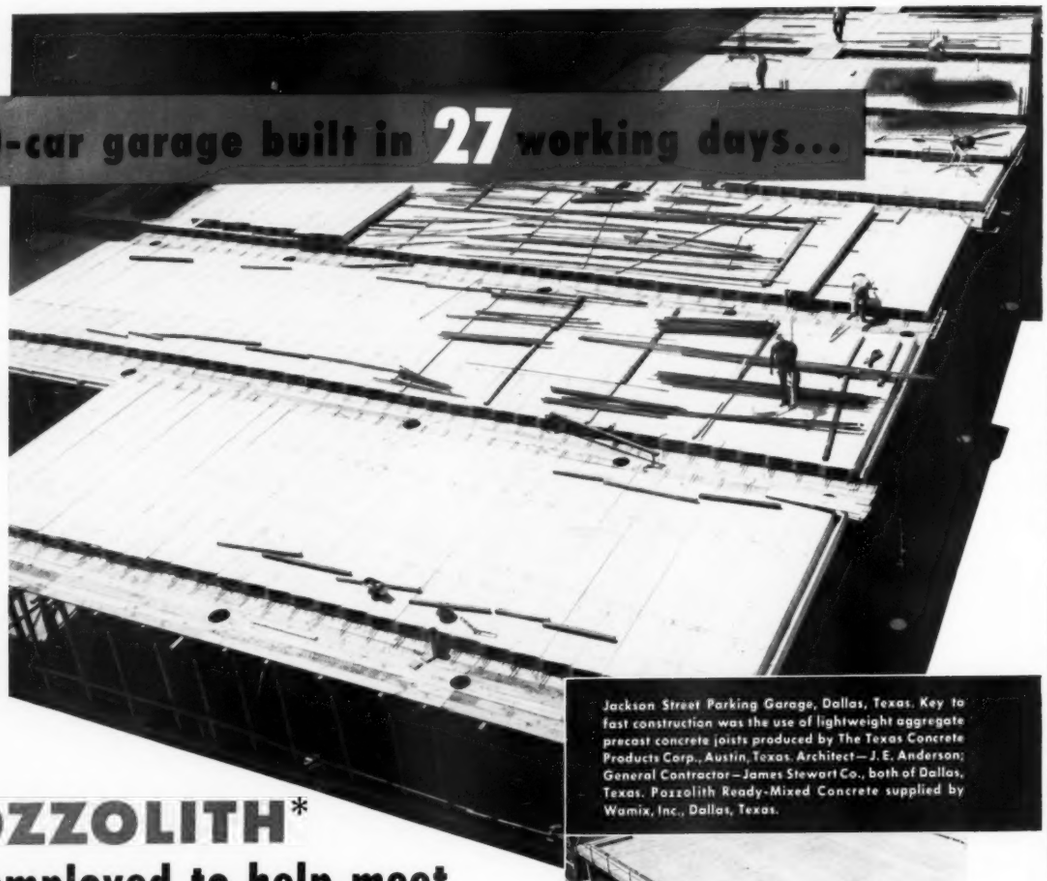
First, Pozzolith makes possible maximum reduction in *unit water content*—most important basic factor affecting concrete quality. See Bureau of Reclamation's current Concrete Manual, Page 130.

Second, Pozzolith fully complies with the water-cement ratio law—basis of ACI and ASTM procedures of design, specification and production of concrete.

Third, adaptations of Pozzolith permit rigid control of entrained air and variations in setting time.

These are the reasons for the wide acceptance and use of Pozzolith . . . last year alone in more than 13,000,000 cubic yards of concrete.

300-car garage built in 27 working days...



Jackson Street Parking Garage, Dallas, Texas. Key to fast construction was the use of lightweight aggregate precast concrete joists produced by The Texas Concrete Products Corp., Austin, Texas. Architect—J. E. Anderson; General Contractor—James Stewart Co., both of Dallas, Texas. Pozzolith Ready-Mixed Concrete supplied by Womix, Inc., Dallas, Texas.

POZZOLITH* employed to help meet concrete requirements

The advantages obtained with Pozzolith in producing the two types of concrete used in this parking garage were as follows:

1. **In the *precast concrete joists,* Pozzolith permitted the design of a workable mix of *low unit water content,* thereby economically providing increased strength, reduced shrinkage, and greater bond of concrete to steel.**
2. **In the *ready-mixed concrete,* placed in slabs, columns and beams, Pozzolith was used as a retarder because of the 100 to 105° temperatures that prevailed. Pozzolith also improved workability, permitting easy placement of high slump concrete without developing segregation, plus all of the other advantages of low unit water content.**

Pozzolith will aid you in meeting *your* concrete requirements. Used in more than 25 million cubic yards of concrete since 1952.

* **POZZOLITH . . . reduces unit water content up to 15% for a given placeability and fully complies with the water-cement ratio law. Pozzolith is produced in three standard formulations—High Early Pozzolith, Normal Pozzolith and Low Heat Pozzolith—to give the results required under varying job conditions.**

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"IRON-CLAD" CONCRETE FOR HEAVY TRAFFIC AREAS

The Masterplate "iron-clad" concrete floor is 4-6 times more wear-resistant than the best plain concrete floor, also corrosion-resistant, spark-safe, easy-to-clean, non-slip, non-dusting and economical. Non-colored and colored.

Section of Masterplate Floor Note Thickness of Armored Surface

Experience in all types of plants has proved the value of Masterplate "iron-clad" concrete floors in helping to maintain a smooth flow of production, reduce maintenance expense and improve plant safety.

Only with Masterplate can a Masterplate "iron-armored" concrete floor with all its important service advantages be obtained. This is because only Masterplate contains the cement-dispersing agent calcium lignosulfonate which makes it possible to easily float a pound or more of the tough, ductile metal on fresh concrete and *keep it at the surface.*

Full information on Masterplate—for new floors and resurfacing old concrete floors—and "do-it-for-yourself" demonstration kit supplied on request by the manufacturer, The Master Builders Co., Cleveland 3, Ohio.

COLORED CONCRETE FLOORS FOR LIGHT TRAFFIC AREAS

Colorcron is being widely used by contractors to obtain uniformly colored, long wearing concrete floors for show rooms, churches, schools, apartments and offices; also for recreation rooms, patios, driveways, sidewalks, breezeways and garages. Floors can be scored to any desired pattern.

Color Plus Long Wear

Colorcron floors cost less additional than painting the floor, outwear the best plain concrete floor, and have more uniform and more intense color than is obtained from the use of pigments put in the mix. Colors: light grey, dark grey, red, brown, black, green, dark green, etc., non-colored.

Full directions for the use of Colorcron may be obtained from the manufacturer, The Master Builders Co., Cleveland 3, Ohio.

FOR NON-SHRINK GROUTING

To avoid shrinkage—principal cause of failure in equipment grouts—plant engineers use Embeco metallic aggregate, the material that produces a flowable non-shrink grout.

Cross-section shows how an easily placeable flowable Embeco Grout counteracts shrinkage to produce full contact with bedplate.

Following are a few of the many other uses of Embeco non-shrink mortar: grouting anchor bolts; grouting steel floor grids; grouting around pipes through walls; caulking bell and spigot pipe; patching floors, ramps and platforms.

A 16-page booklet of useful data and information on the Embeco Non-Shrink Method of Grouting may be obtained from the manufacturer, The Master Builders Co., Cleveland 3, Ohio.

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EDITORIAL

The Bright Western Outlook

Water, power, transportation, and fuel—important factors in the development of any region—have been doubly important in the development of the West. Today the concern of engineers rests with the increasing development and utilization of these factors to sustain the area's growing industries. The shift of industry and large segments of population to the west in recent years has been accomplished smoothly thus far, largely because men with vision have made huge plans for this region. Planning and constructing facilities needed for industry and huge urban populations are still being carried forward to permit future growth of the West.

The Dalles Dam is one of the latest of these projects. A construction report on The Dalles begins on page 24 of this issue. But even before the turbines of this hydroelectric installation on the Columbia begin to spin, work will be under way on other major western dams by either U. S. Government agencies or private enterprise. Power planners are gearing construction of these facilities to what they believe will be an unprecedented rise in industrial needs.

The Richmond-San Rafael Bridge, whose story begins on page 5, represents the latest attempt of engineers to solve the growing complexity of traffic problems in large western cities. Like planners in crowded metropolitan centers elsewhere in the nation, California designers had to overcome a number of obstacles to build the span, the third major bridge crossing of the bay near the Golden Gate. And even as this is written, a fourth bridge has entered the preliminary study stage.

The western engineer is planning for a bright future. No section of the country is now constructing more modern highways and bridges. Reclamation work, cut back to projects which are patently sound, is again being carried forward. Part of the West's fuel problem may soon be solved when natural gas from Texas and from the northern Canadian wilderness will reach the Pacific Northwest through one of the most ambitious pipeline projects ever conceived.

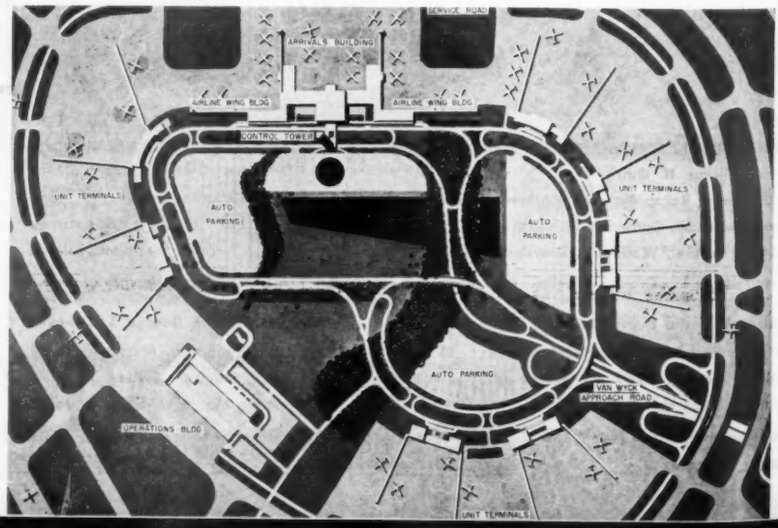
Plans now being prepared and the projects reported in this issue, emphasize that construction will make many changes in the West. Contractors, engineers, material men, equipment manufacturers, are embarking on what is to be the West's greatest construction program. As long as the West—and the rest of the nation—has a healthy growing construction industry, the future is bright indeed.

NEWS AND VIEWS

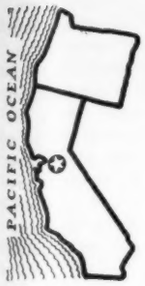
Of all western construction now planned, some of the biggest lies in two separate water-conservation programs for California. One—the $1,500,000,000 Feather River project—will have the highest and biggest concrete dam in the world, requiring some 14 million cubic yards of concrete. The second is the Trinity River Project, to be located about 100 miles away, which the Federal Bureau of Reclamation plans as part of the Central Valley power, reclamation, flood control, and navigation system. Both jobs, located near the Oregon state line, would divert water for irrigation through new tunnels and existing canals to the Sacramento and San Joaquin Valleys about 500 miles to the south.

The estimated need of $9 billion for new public water and sewerage facilities, determined by the President's Council of Economic Advisers, may have to be revised when the report of a recent U. S. Department of Commerce study is published shortly. On the basis of investigations made by the department's Water and Sewerage Industry and Utilities Division, it is now estimated that $25 billion will be required for a 60 per cent increase in such construction to keep pace with population growth over the next ten years. Financing of this work—one of the toughest problems to solve—will probably be done through revenue bonds rather than by taxes.

Another solution to financing the multibillion dollar highway program—a subject on which the Senate Public Roads Subcommittee is currently holding hearings—has come from Richard G. May, an official of the American Railway Engineering Association. May, making his views known at the group's annual meeting a few weeks ago, said that since railroads must pay heavy taxes on lines which they build and own, heavy trucks using state-built roads should be taxed a rate which 'takes into account the abnormal weights they impose on roads", thus providing more revenue for financing the new road-building program.



The proposed nerve center for air traffic at New York City's Idlewild airport lies in this 655-acre oval-shaped area which will contain a $60 million passenger terminal development. Construction on the project—which includes ten buildings capable of handling 140 aircraft at one time—is slated to start this fall.



Construction enters the final stages as steel trusswork is erected on the span across upper San Francisco Bay.
Ray Day Photo

Design innovations mark new Richmond-San Rafael Bridge

When the Richmond-San Rafael Bridge across the 4-mile arm of upper San Francisco Bay opens in October, it will be one of the easiest bridges to maintain and operate in the United States. The over-all 21,343-foot length of the structure, exceeding that of the new Chesapeake Bay Bridge on the east coast and yielding first place only to the San Francisco Bay crossing, made design alone a job of the first magnitude.

Connecting Richmond in Contra Costa County and San Rafael in Marin County, the bridge will be 5½ miles long and span 4.01 miles of water. This will provide a link between U. S. 40 and the San Francisco Bay Bridge 10 miles to the south, and between important east shore points and U. S. 101 in Marin County to the north.

The San Rafael approach starts on the west shore of the bay, continues east with the Richmond-San Rafael ferry trestle, and makes a connection with the trestle approach. The total length of both structures is about 2,800 feet. Out over the water, nineteen 100-foot plate-girder spans are followed by fourteen 289-foot truss spans, a 535–1,070–535-foot cantilever span, ten 290-foot truss spans, another 535–1,070–535-foot cantilever span, twelve 290-foot truss spans, and seventeen 100-foot plate-girder spans. The bridge then continues through the mole fill separation structures to the Richmond approach.

This long structure requires some extremely large components. The top of the highest tower is 325 feet above water surface, and the longest steel pile for the bridge goes to a depth 241 feet below the bay surface.

Eventually the superstructure will carry two 36-foot curb-to-curb decks, but during first-stage construction, the top deck will be paved to permit operation of two 18-foot traffic lanes with sufficient space for passing and emergency parking. When the bottom deck is paved, each deck will carry one-way traffic in three 12-foot lanes.

An initial bond issue of $62 million provides for the one-deck bridge, and a $10 million bond series for the remaining work can be sold after the span has been operating for 36 months. This $72 million in bonds will also cover operating and maintenance expenses once the span is opened.

Maintenance Features

Bridge maintenance and operation

(Continued on next page)

22-year-old Asphalt pavement will serve North Carolina for years to come

The North Carolina Highway Department paved this 13-mile section of US Route 158 in 1932 with a plant-mixed "Sand-Asphalt" pavement, 5 inches thick and 18 feet wide. This pavement was fully adequate for traffic then, but not for the volume and weight of traffic using the highway today.

While not wide enough or thick enough for 1955 traffic, the old asphalt pavement on US 158 is being completely salvaged by North Carolina. The State is widening the existing pavement two feet on each side with a 5½-inch thickness of plant-mixed Texaco "Sand-Asphalt" and resurfacing it with approximately three inches of the same type of construction. Thus, the original pavement, which served North Carolina traffic satisfactorily for over 20 years, has become an integral part of a new, wider, stronger highway. It will continue to serve this state for years to come.

Texaco "Sand-Asphalt" paving has been constructed on a large mileage of North Carolina highways. It is one of a number of plant-mixed types of paving for highways, streets, airports and parking areas, for which either Texaco Asphalt Cements, Cutback Asphalts or Slow-curing Asphaltic Oils are recommended. A helpful booklet which describes the methods and materials used in all of the plant-mixed types of Texaco Asphalt paving may be obtained without obligation by writing our nearest office.

Constructing a plant-mixed Texaco "Sand - Asphalt" pavement on US 158, Currituck County, N. C. Edge of new pavement is 5½ inches thick. Old 18-foot highway has been widened to 22 feet.

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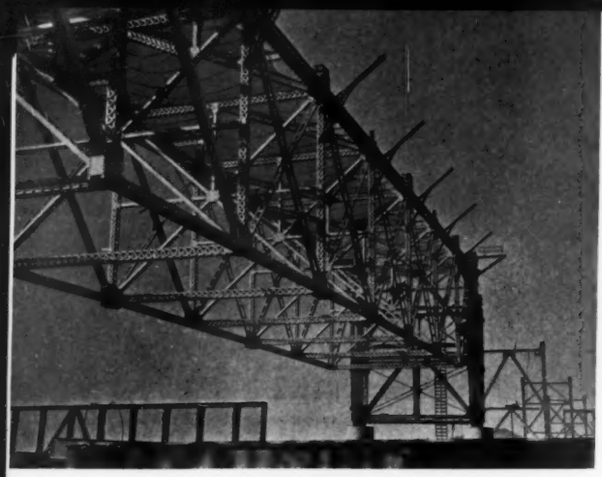
TEXACO ASPHALT



A safety net strung up before the riveting crew moves onto the trusses will protect men against falls. The net will also serve to protect men working below from falling objects.

(Continued from preceding page)

—as well as a structure with grace and high strength—concerned design engineers of the California Division of San Francisco Bay Toll Crossings from the start. And in working on the new span, the engineers made good use of the lessons learned on the San Francisco Bay, Golden Gate, and other bridges throughout the nation. As a result, the Richmond-San Rafael Bridge will incorporate a number of special design features to make its upkeep simple and efficient.

Every structural member in the bridge is placed so that it is accessible for cleaning by maintenance forces. This is expected to save many man hours in maintenance expense, thus amortizing the bridge bonds earlier.

The entire over-water section of the bridge will have an integral supply of compressed air for sandblasting, spray painting, and foghorn operation. This item has sometimes been overlooked on long bridges, with the result that air compressors have tied up automobile traffic in one lane. On the Richmond-San Rafael Bridge, the compressed air will be carried in a 2½-inch steel pipe. The air will be supplied by electric-driven stationary compressors, either or both of which will turn on automatically when air pressure in the line falls to a predetermined level.

Fresh water piping will supply water for sanitary and drinking purposes on the Marin County side, and for wash-cleaning of structural members and fire-protection purposes on the bridge itself. At one point, the pipe rises to a maximum height of 220 feet over the main navigation channel. Water will be boosted to this point by a 15-hp electric-driven multistage pump. As on the air line, a number of outlets will be provided for maintenance forces.

Maintenance Operations

Special maintenance tracks under each deck throughout the steel portion of the structure will be used by three small traveling gantrys or platforms. These, operated for the convenience of painters, will also be used to transport supplies and material for use in bridge maintenance.

All vehicular lanes will be free of maintenance vehicles at all times. Crews will travel to work in a bus which, after dropping them off, will return to the Administration Building. Should an emergency arise, one of the men or foremen will be able to place a telephone call to headquarters by using one of the emergency plug boxes located in strategic spots along the span.

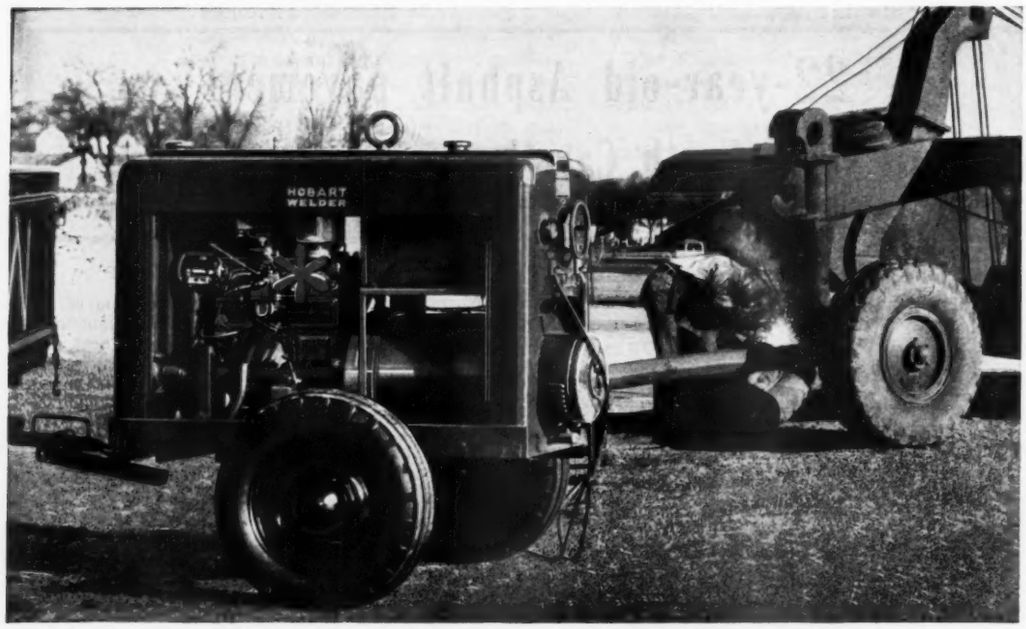
All electric wiring will be laid in four steel troughs placed under the curbs. These troughs, sufficiently large to provide space for any wiring needed in the future, will protect men who must work close to the installations.

The designers have provided removable curb plates to simplify repair work or the addition of new facilities. Steel curbs on each side of the 36-foot roadway will have the half-round contact surfaces which studies and experience show vehicles will not climb.

A 6-inch continuous clear opening between the under portion of each curb and the concrete slab will provide free passage for surface water and dirt on the bridge deck. Under normal conditions, the wind across the bay will sweep the deck clean. Should mechanical sweeping be done, the dirt will be pushed through these openings into the bay.

Special Features

Automatic controls and protective electrical switching will cut down enormously on the electrical force needed for maintenance. Automatic switching has been provided to bring power to the bridge from either the Marin or Contra Costa county side in the event of power failure. New photoelectric controls will be installed to handle roadway lighting, aviation beacons, and navigation signals on the bridge. These controls will be arranged in groups of three so that area lighting can be achieved. If fog should drop down over the western end of the bridge, the units will automatically turn on the lights in this fog-



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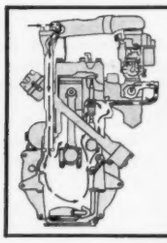
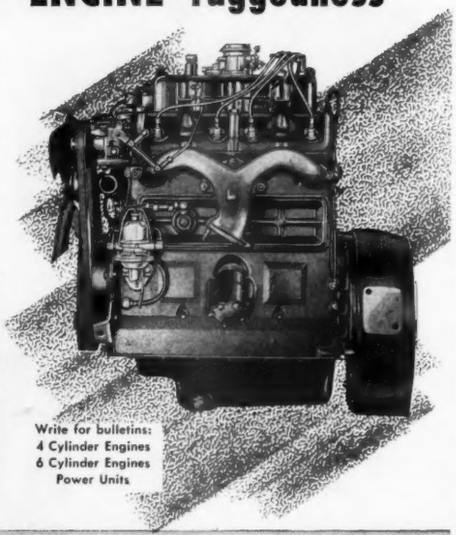


POSITIVE crankcase ventilation

Willys positive ventilation is automatically regulated to engine speed. Filtered air forces removal of oil-thining or acid-forming condensates. It is one of many Willys "proven-in-action" features for rugged power uses.



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shrouded section. For the first time on such a large scale, fluorescent lighting is being adopted throughout the length of the project.

One of the most important design features provides for a future increase in the traffic load. If traffic grows so that the Richmond-San Rafael Bridge deck is no longer capable of handling the load, a dead-load reduction up to 2,900 pounds per linear foot of bridge deck can be made. This can be done without altering the floor girder system.

The floor plate girders will be spaced so that they can handle heavier loads than those now on the highways. Simply by removing the 6-inch roadway slab—which weighs about 60 pounds per square foot—and replacing it with an open-type steel grating or other material—which weighs as little as 20 pounds per square foot, much heavier live loading can be developed.

On the new bridge, there will be one-man control by a toll sergeant, who will be based in a central headquarters office in the Administration Building. There, an automatic recorder board will make it possible for him to check every portion of the bridge at a glance. If necessary, he can direct rescue or tow units, call individual toll collectors, check every light and foghorn on the bridge, and make contact with both ends of the span by means of a two-way short-wave radio system. Units of this system are now being tested on floating equipment used in construction of the span, in the office of the California Division of San Francisco Bay Toll Crossings at Berkeley, and in the division's field offices at Richmond and San Rafael.

Location Survey

One of the difficult preliminary engineering operations was the establishment of a survey control to tie down all portions of the bridge. The surveying, extensive and costly, required the location of 79 piers in 4.01 miles of open water racked by high winds, waves, and treacherous currents.

The survey control is a triangulation net extending from Richmond to San Rafael and Sausalito. All 13 primary stations are located in high places. Five are located in Contra Costa County, six are in Marin County, and two are on Red Rock

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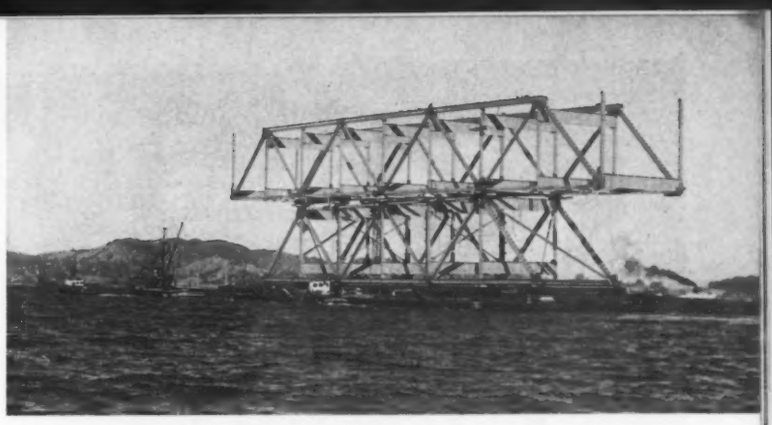
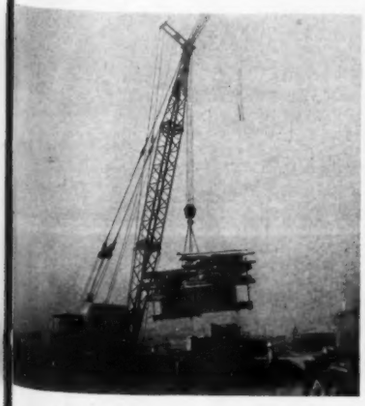


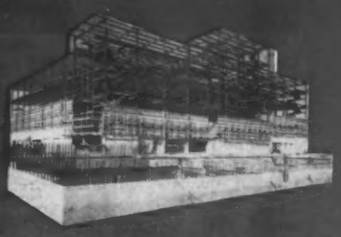
Floating-in operations continue despite a 23-mph wind sweeping across the bay. The steel truss being towed to the bridge site by barge will be lowered into place as the tide ebbs.



A Lorain Moto-Crane handles steel in the Richmond fabrication yard. (See article on page 20.) Altogether, 48,000 tons of structural steel are going into the bridge.

big savings of time and money!

on another job with Whiteman equipment



May Co. Department Store, North Hollywood, California. Albert C. Martin, Architect; T-S Construction Engineers, Inc., General Contractors.

At least 20 hand buggies and 20 men would be required to haul and pour the concrete being handled by 4 Whiteman Power Buggies on the May Co. job. They're gluttons for work. Never get tired or slow down.

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Yours very truly,

T-S Construction Engineers, Inc.

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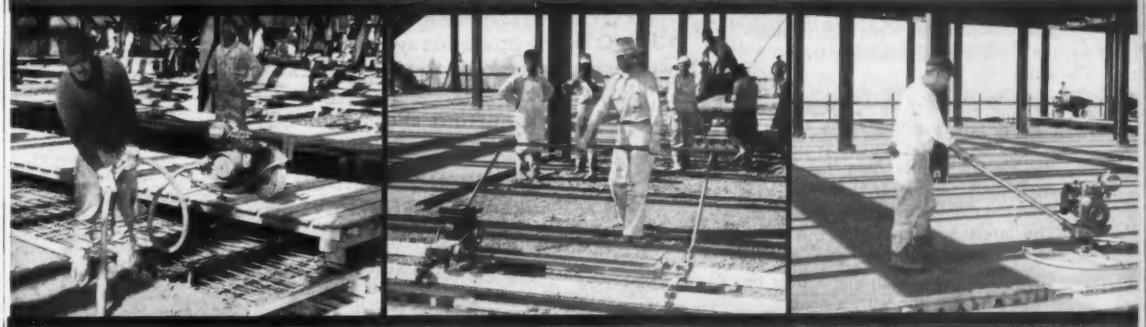

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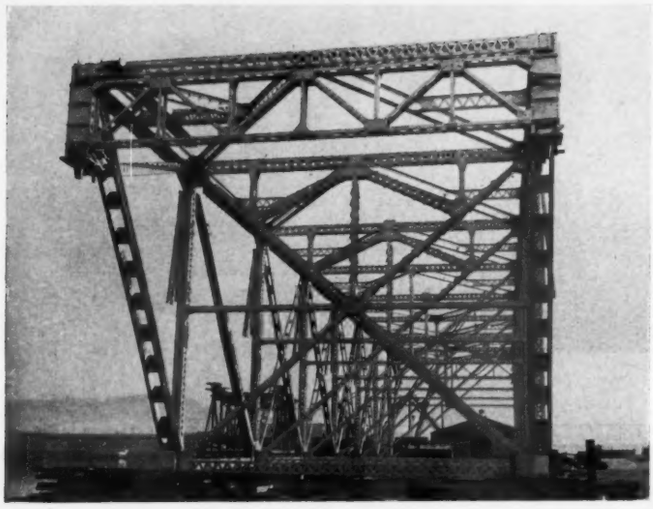

One of the two 117-ton and 280-foot-long aluminum trusses fabricated at the site to support steelwork. For details on this operation see article starting on page 20. Aluminum members for the truss came from the Massena, N. Y., plant of Aluminum Co. of America.

and Angel Islands in the bay. Two base lines about 10,000 feet long were laid out—one in Richmond, the other in Sausalito. These lines were measured with a standardized Invar tape to an accuracy of 1 in 4 million.

The triangulation of this primary system was set up according to standards set by the U. S. Coast and Geodetic Survey, requiring an accuracy of 1 in 25,000. Final closure of the Richmond-San Rafael Bridge control net was 1 in 70,000, well within the required limits. The instrument used for turning angles was a T-3 Wilde optical theodolite, which reads directly to 0.1 second. Bare flashlight bulbs of various intensities were used for night sights.

The entire survey was tied into the California coordinate system as is required for this type of bridge by California state legislation. The solution of 48 simultaneous equations was necessary to get the required length.

Test borings were located from this primary net with two sextants, using a three-point fix. Survey platforms were set by the substructure contractor. State crews placed control points on these platforms, which were also used for other construction operations. Accurate points from the basic triangulation net were set immediately when a pier emerged from the water. All precise work was done at night to minimize interference from heat waves or atmospheric disturbances and to take full advantage of the electric lights used for sights. Even the sounding of the water was done electronically by the contractor. The latest equipment for this work turns out a graphical plot of the underwater ground profile simply by traversing the line with a boat.

The greatest single problem on the Richmond-San Rafael job was posed by the 4.01-mile stretch of water to be bridged. This distance caused a number of construction problems, financing problems, and communication problems.

Financing is now virtually complete for the structure, and operations like precasting and driving pier shells and steelwork erection are bringing the span swiftly to completion.

THE END

Anthony N. Mavroudis Joins C&E as Field Editor

Contractors and Engineers this month adds Anthony N. Mavroudis to its staff as field editor. Mr. Mavroudis, of Forest Hills, N. Y., received a civil engineering degree from the College of the City of New York and has worked with the U. S. Navy Bureau of Yards and Docks.

He recently served two years as a commissioned officer with the U. S. Army Corps of Engineers and during this time was resident engineer supervising construction in Newfoundland.

Mr. Mavroudis will cover the eastern section of the country for *Contractors and Engineers* from its New York City headquarters. C&E's roving editorial staff also includes Bill Quirk, Ralph Monson, Ray Day, Frank Kypreos, Bill Dowdell, and Bill Darden.

Anthony N. Mavroudis, recently appointed field editor on the staff of *Contractors and Engineers*.

ENGINES CLEAN, UPKEEP COSTS L

ISBELL Construction Company, Reno, Nevada, operates mechanized equipment worth many millions of dollars. Diesel equipment alone, for example, is valued at nearly $3,000,000. For many years now, Isbell has lubricated engines in this vast array of equipment with Texaco. The company explains that —

"Considering the tough jobs we do where our equipment is exposed to dirt and bad weather, Texaco gives our engines outstanding protection. Our engines run clean, bearing wear is at a minimum and down time is negligible. Our maintenance costs are low, too."

Isbell relies on the famous *Texaco Ursa Oil* series — a complete line of lubricating oils especially refined to make diesel and heavy duty gasoline engines give *more power* with *less fuel* over *longer periods* between overhauls. Whatever the size, type and speed of *your* engines, or fuel used, there is a member of this famous series exactly right to assure these benefits.

For chassis lubrication, Isbell uses *Texaco Marfak* — it assures longer lasting protection against wear and rust. It won't squeeze or jar out of bearings, seals out dirt and moisture.

For wheel bearings, Isbell uses *Texaco Marfak Heavy Duty* — it protects against dirt and moisture, seals itself in, assures safer braking. No seasonal change required.

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Let a Texaco Lubrication Engineer help you simplify and improve your lubrication practices. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TUNE IN...TEXACO STAR THEATER starring JIMMY DURANTE or DONALD O'CONNOR on television... Saturday nights, NBC.

TEXACO

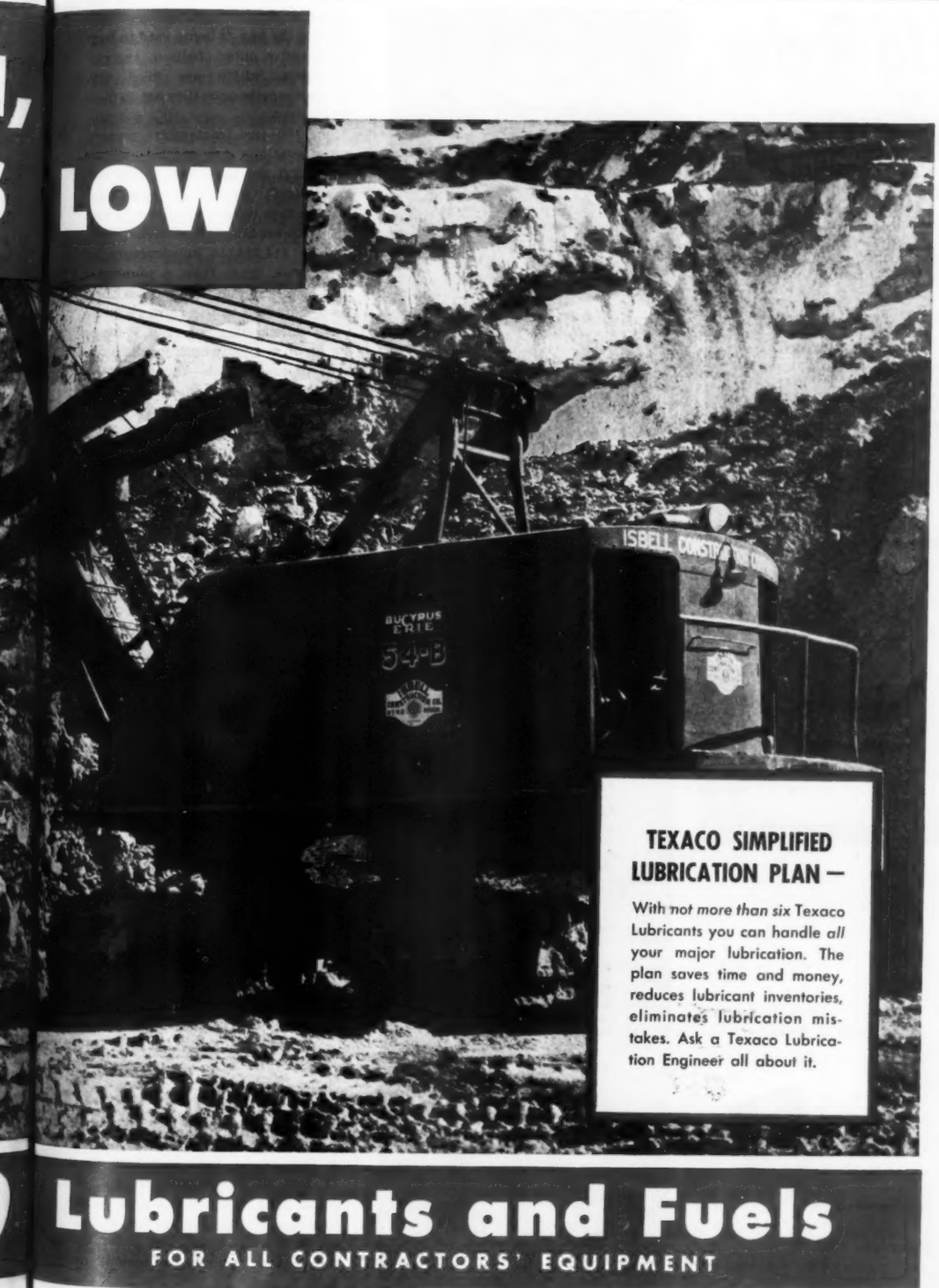
National Constructors Elect New Officers

The newly elected head of the National Constructors Association is T. C. Williams, executive vice president of Stone & Webster Engineering Corp., Boston, Mass. He succeeds John F. O'Connell, vice president of The Bechtel Corp., San Francisco, Calif.

Elected vice president of the association, a group of leading engineers and builders of chemical and power plants, refineries, and steel mills, was C. D. Haxby, vice president of the Rust Engineering Co., Pittsburgh, Pa. C. B. Bronson was re-elected secretary-treasurer.

Named chairman of the labor committee was P. L. Wetcher, personnel coordinator for C. F. Braun & Co., Alhambra, Calif. Eric Miller, personnel and labor-relations manager for The H. K. Ferguson Co., Cleveland, and J. E. Quinn, director of labor relations for Procon, Inc., Des Plaines, Ill., are co-chairmen of the committee. Chairman and co-chairman, respectively, of the safety committee are J. G. Hand, Foster Wheeler Corp., New York, N. Y., and C. A. Clore, supervising construction engineer for The Girdler Co., Louisville, Ky. The chairman of the foreign committee, J. F. Ryan, business manager for Foster Wheeler, is assisted by co-chairman R. E. Atkinson, Koppers Co., Pittsburgh.

T. C. Williams, center, the new president of National Constructors Association, is flanked by C. D. Haxby, right, vice president of the organization and P. L. Wetcher, chairman of the labor committee.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FOR ALL CONTRACTORS' EQUIPMENT

New District Engineers For Portland Cement Group

Harold G. Garner and Kenneth B. Lucas have been named district engineers of the Kansas City, Mo., and Omaha, Nebr., offices, respectively, of the Portland Cement Association, Chicago, Ill.

Mr. Garner, a division soils engineer for the Missouri State Highway Department from 1930 to 1940, joined the association 15 years ago as a soil-cement engineer with the Omaha office. He has served the organization as paving engineer and district engineer in various offices since then. Before his present appointment, he was district engineer of the Omaha office. A registered professional engineer in Missouri, he is a member of the American Society of Civil Engineers, the National Society of Professional Engineers, and the Nebraska Engineering Society.

Mr. Lucas, a former construction engineer who has served with the Kansas State Highway Commission in various capacities, joined the association in 1947. He served as field engineer and paving engineer for the organization until his present appointment. He is a registered professional engineer in Kansas and, like Mr. Garner, a member of ASCE and NSPE.

Succeeding James D. Piper as district engineer of the Austin, Texas, office of the Portland Cement Association, Chicago, Ill., is Thomas D. Shiels. Mr. Piper has been named vice president for promotion of the association.

Mr. Shiels, who holds a degree in civil engineering from the Virginia Military Institute, has been with the organization for more than 25 years. Before joining the Association in 1925, he was with the Florida State Road Department and, earlier, with a Florida construction firm. He is president of the Dallas branch of the American Society of Civil Engineers.

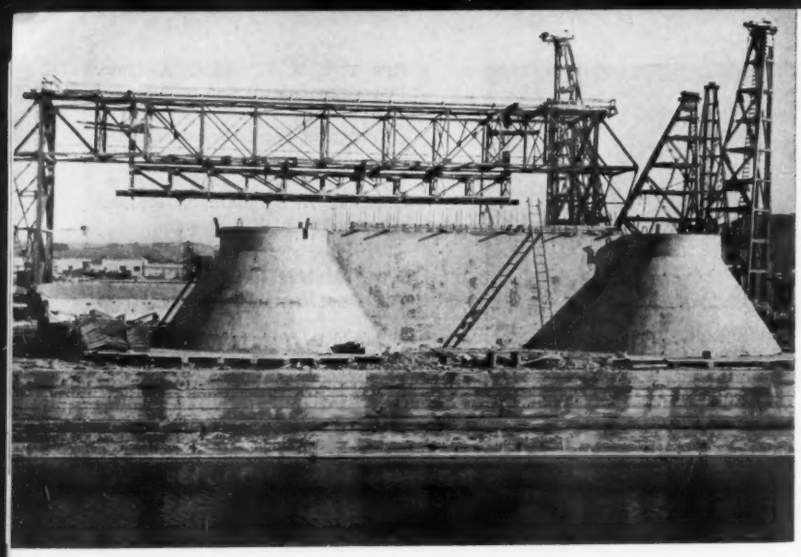
Huge Plant Exhibit Shows Harnischfeger Equipment

More than a million dollars worth of machinery—including a variety of heavy-construction equipment—made up an exhibit which proved a highlight of the annual sales conference and open house held recently at the Harnischfeger Corp. plant in Milwaukee, Wis.

Assembled for this giant display were 15 models in the line of P&H power cranes and shovels, plus welding equipment, diesel engines, hoists, soil stabilizers, and the new P&H elevating Sierra Loader. P&H truck cranes of from 8 to 35-ton capacity were among the units shown.

Harnischfeger's latest large electric shovel, the P&H Model 1800, was demonstrated in the plant yard.

Nearly 1,000 persons visited the plant and viewed the exhibit, reportedly one of the largest inside showings ever held of construction and industrial machinery.



Cone diaphragms which will fit over the lower shell sections are cast with Economy and Universal steel forms. Because of the size of the units—and their 30 to 100-ton weights—they are made on barges in the south yard slip.
Ray Day Photos

Off-site precasting aids work on massive pier shells

Substructure work on the Richmond-San Rafael Bridge across upper San Francisco Bay has been facilitated by the smooth operation of the precasting yard used by the contractors. The yard, located at Petaluma on one of the northernmost navigable arms of the bay, is being used to form the massive outer shells of the pier structures, which are filled with tremie concrete once they are in place in the bay.

The 100-acre tract where precasting operations are carried on was purchased shortly after World War II by Ben C. Gerwick, Inc., San Francisco, a firm which joined forces with Peter Kiewit Sons' Co., Omaha, Nebr., on the $14,234,550 substructure for the bridge. Since then, a number of new construction techniques have been employed at the yard, including the gunite coating of steel H-beams for an oil company dock job. The current precasting job—the largest yet done at the site—requires about 25 acres of the tract.

Efficient Organization

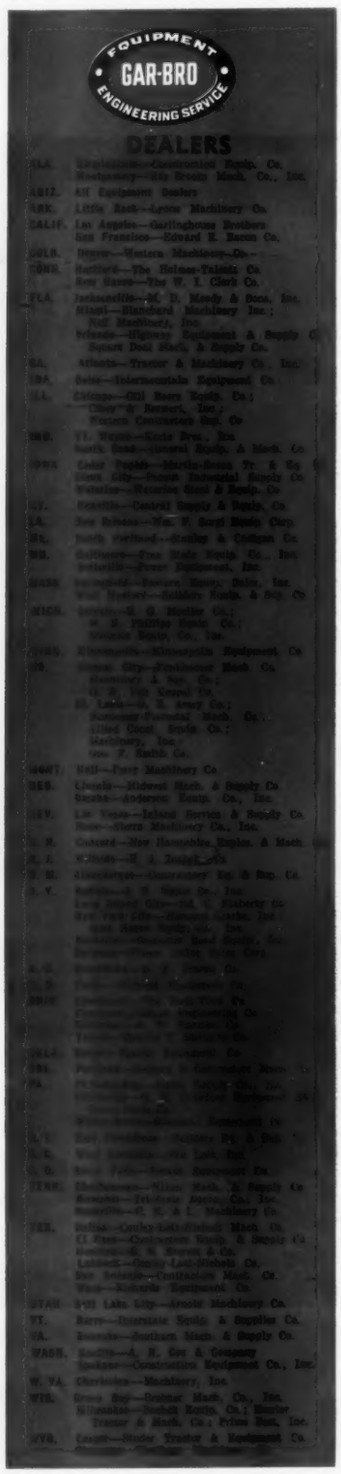
The Richmond-San Rafael precasting job was such that the yard was divided into a north and south section, each having responsibility for many types of precast members. Of the two principal casting ways located in the north yard, one is devoted entirely to the bridge precasting operation. Both casting ways have 125-foot gage railroad tracks, each of which carries 100-ton traveling gantry-type cranes. The use of this wide gantry crane with 25 feet of headroom underneath made it possible to precast members with considerable ease.

The north yard gantry crane carries a two-drum hoist powered by a small upright steam boiler. A diesel-driven motor generator set supplies electric power for driving the unit. An extension to the railroad tracks enables the gantry to pick up heavy sections and set them directly on barges which carry precast pieces to the job site.

Another feature of the north casting yard is a 100-foot spaced-rail-mounted concrete-pouring gantry. Closer rail spacing on this rig permits concrete placing to be done while the bigger traveling crane passes the area.

In the south yard, a 105-ton gantry-mounted traveling crane operates on 45-foot center rails and has about 23 feet of headroom. Serving the south yard also are a Lorain Moto-Crane, a Northwest 6 crawler, and an old locomotive crane. The latter unit has a remarkably high capacity despite its age.

for short cuts to faster concrete handling...



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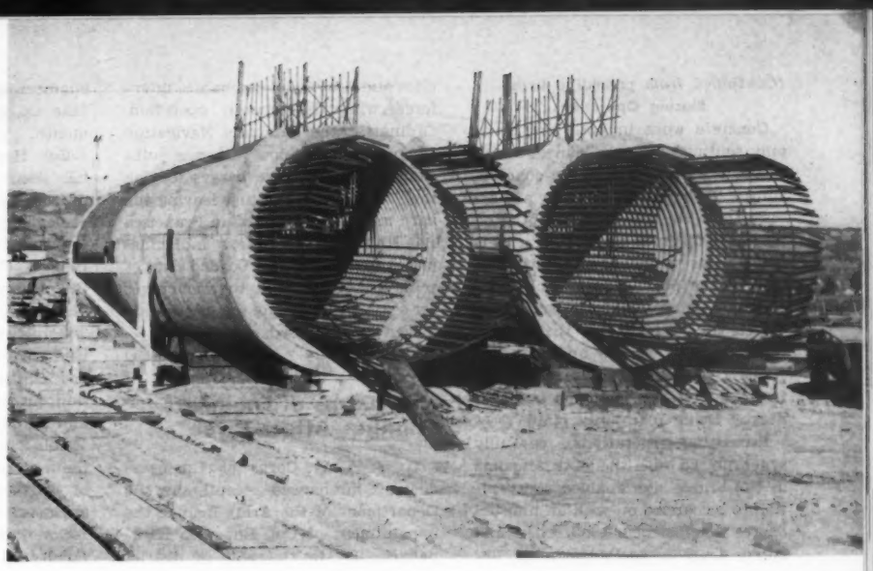

These light pier shells are precast in the north yard of the Ben C. Gerwick precasting facility at Petaluma, a short distance from the bridge location. Heavier shafts were made on barges and transported to the work site.

Well organized yard turns out four basic types of units; production is geared to concrete placement at bridge site

Types of Sections

Main precast units fall into four basic divisions: the base grid sections; the lower shell; the cone diaphragm sections; and the pier shafts. To a lesser extent, solid spandrel beams were also precast, and a few box girder sections were made in the yard.

The big base grid sections, weighing from 15 to 77 tons, were all precast in the north yard. Despite their size, the units were prefabbed easily. After the reinforcing steel had been positioned accurately, special collapsible removable inserts were set for the slotted opening which later passed the steel H-beams. Lifting hairpins which made it easier to pick up the slabs were also installed.

Pier shafts, which weigh from 30 to 100 tons each, were also precast in the north yard. Only the lightest of these units were made in the north yard itself; the heavier pieces were made on barges just off the north yard slip. Since the level of the barge fluctuated with the tide, carpenters—used to working on land—were confused until true bench marks were established ashore. Surveying equipment was used to make their job easier.

Also manufactured on barges were the big 100-ton solid spandrel beams, which were among the heaviest units. These were precast with the help of Speed forms and Economy steel forms—an item which represented a $100,000 investment for the contractor.

In the south yard, work was done on the lower shell sections, which weighed from 20 to 50 tons apiece. Precasting these units was made difficult by the fact that extensive reinforcing steel stuck out above the shell. This steel, which fits into the cone sections, protruded far enough to interfere with the headroom of the gantry crane and prevented one unit from being raised above the other. This made it necessary to schedule the precasting of these sections so that they could be moved directly to the barges by the gantry crane. When this was done, the Northwest 6 moved in to attach special guide towers and spreader trusses to the unit. These remained in place until the cone diaphragm sets were installed.

These cone diaphragm shells, weighing from 30 to 100 tons each, were either so large or so heavy that they were manufactured on barges in the south yard slip.

Eight small cone diaphragm sets for some of the smaller piers were formed in the yard and loaded on barges later, since these units could be handled readily by the gantry crane.

(Concluded on next page)

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- Narrow sharp replaceable point penetrates in hard, compact ground
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BULLDOZER CORNER ADAPTERS

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(Continued from preceding page)

Placing Operations

Concrete work in both the north and south yards was conventional, except for that done by the concrete gantry. This rig was served by a short tower and hoisting bucket. With the help of a transfer bucket and a concrete chute which could reach any part of the pour, the rig took fresh concrete from truck mixers and placed the material for the precast units. Crawler cranes and Gar-Bro transfer buckets were also used. The fresh concrete was batched out of a nearby Noble ready-mix plant.

Precasting operations, carefully synchronized with the work schedule at the bridge site, enabled construction to be carried on with an unusual degree of efficiency, good order, and speed. Only a combination of low tides and heavily loaded barges interfered with the smooth operation. Ordinarily, the Petaluma Navigation Channel, even at low tide, was sufficiently deep to serve barges leaving the yard. Barges and tugs leaving the yard moved into north San Francisco Bay to the point where individual pieces were needed. Loaded barges were usually moored to anchorages for a short time before the pieces were picked off and used.

THE END

New Corps of Engineers Changes Affect Three

U. S. Army Corps of Engineers changes announced recently by the Department of the Army include the appointment of Col. Elmer E. Kirkpatrick, Jr., to the post of district engineer at Jacksonville, Fla. He will take up his new duties early next month.

Col. Herman W. Schull, Jr., who has been Jacksonville district engineer since February, 1952, will become lieutenant governor of the Canal Zone government at Balboa Heights, Canal Zone. He will succeed Col. Harry O. Paxson, Canal Zone, lieutenant governor since July, 1952.

Col. Kirkpatrick has served as district engineer at Milwaukee, Wis., and has held posts in the Northwest division, province of Edmonton, Canada, and the Manhattan district.

Col. Schull has served as chief of the war plans division in the Chief of Engineers Office, and as district engineer at Buffalo, N. Y.

Col. Paxson formerly was on the faculty of the National War College.

Harry A. Kuljian, named "Engineer of 1954" by the Pennsylvania Society of Professional Engineers.

Engineer Society Selects Kuljian Engineer of 1954

The Pennsylvania Society of Professional Engineers has selected Harry A. Kuljian "Engineer of 1954". Mr. Kuljian is president of the Kuljian Corp., engineering and construction firm of Philadelphia.

Cited for his outstanding achievements as a consultant, designer, and engineer-builder, Mr. Kuljian holds degrees in both mechanical and electrical engineering and recently received an honorary degree of Doctor of Engineering from Drexel Institute.

He is a fellow of the American Society of Mechanical Engineers and a member of the American Institute of Electrical Engineers.

Baldwin-Lima-Hamilton Buys Electronics Firm

The Baldwin-Lima-Hamilton Corp., Lima, Ohio, manufacturer of a line of shovels, cranes, and contractor's locomotives, has announced the acquisition of 100 per cent ownership of Ruge-de Forest, Inc., Cambridge, Mass., manufacturer of industrial testing equipment and electronics machinery.

B-L-H officials also announced that the new subsidiary's operations will complement activities of the O. S. Peters Co., Washington, D. C., a firm engaged in the manufacture of similar testing and electronic devices. The Peters Co. was acquired by Baldwin-Lima-Hamilton last year as a wholly-owned subsidiary.

Present officers of Ruge-de Forest, Inc., will continue to direct the firm's operations.

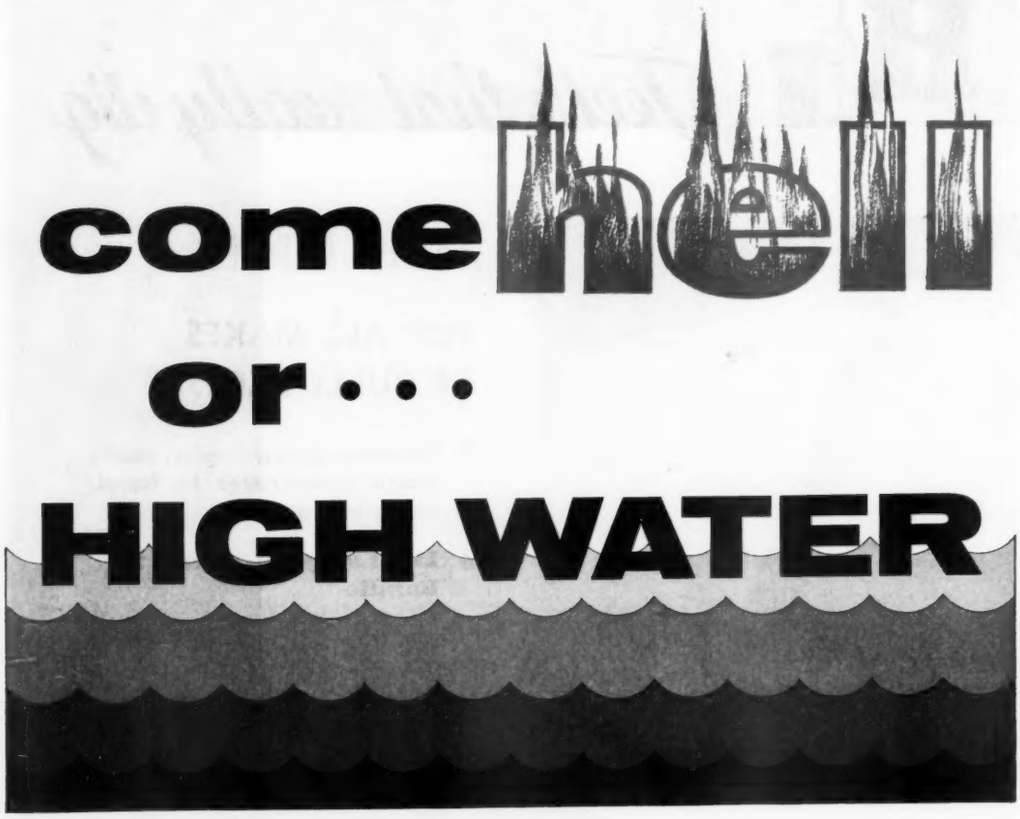
Other B-L-H acquisitions in recent months include the Madsen Iron Works, Los Angeles, and Hydropress, Inc., and the Loewy Construction Co., Inc., both of New York City. Major B-L-H plants are at Eddystone, Pa.; Hamilton, Ohio; Lima, Ohio; Aurora, Ill.; Rochelle, Ill.; Burnham, Pa., and San Francisco.

Gar Wood Promotes Trivan

Following reorganization of its traffic department to achieve more centralized control over its five widely-scattered plants, Gar Wood Industries, Inc., has appointed George Trivan to the newly created post of general traffic manager.

Walter J. Derkatz has been named traffic manager for the Wayne, Mich., plant.

Mr. Trivan formerly was traffic manager of the Findlay, Ohio, plant.



Longer lasting asphalt roads requiring less maintenance are made by using Pave, the additive that effectively overcomes the effects of water by remaining fully active in asphalt at all working temperatures.*

Pave-treated asphalt overcomes the natural preference of aggregate for water providing a total asphalt coating—not just a cover—for aggregate and roads where moisture is found on the surfaces from any one of many causes. Pave in finished roads resists water creep between asphalt and aggregate which weakens the bond and causes road breakdown.

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Revised Volume Treats Construction Materials

The new sixth edition of "Materials of Construction", a standard text containing up-to-date information on the manufacture, properties, and use of engineering and construction materials, has been expanded by 15 per cent and thoroughly revised to reflect the latest available data.

The book, written, edited, and revised by three university professors of engineering, is published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

Fundamentals of engineering and construction are carefully treated in the early portion of the book. Later on, individual materials are described in detail in separate chapters, with attention to the manufacture, properties, methods of testing, and application of each type of material.

Major sections of the book are devoted to metals, building stones and mineral aggregates, cementing materials, concrete, brick and clay products, timber, organic plastics, laminates and adhesives, and organic protective coatings.

New in the sixth edition are sections on service requirements of metals, mineral aggregates, metallography and constitution of metals, classification of structural clay products, and organic protective coatings.

Long recognized as an authoritative and comprehensive text on construction materials, the book is the work originally of the late Adelbert P. Mills, professor at Cornell University. Subsequent editing was done for later editions by the late Harrison W. Hayward, professor at the Massachusetts Institute of Technology. Lloyd F. Rader of the University of Wisconsin has edited this sixth edition.

"Materials of Construction", sixth edition, is priced at $7.50 a copy and may be ordered from the publisher.

American Hoist & Derrick Acquires Laughlin Firm

American Hoist & Derrick Co., St. Paul, Minn., has acquired the Thomas Laughlin Co., Portland, Maine, maker of forged wire rope accessories, as the first step in a planned expansion program.

The merger will make it possible for American Hoist to market products of both companies more effectively by offering a complete line of fittings and wire rope accessories from a single source.

The 50-year-old Laughlin firm will be operated by American Hoist & Derrick as the Thomas Laughlin Division, and there will be no change in plant personnel.

Donald S. Laughlin, former president of the Maine firm, and Andrew W. Peat, former treasurer, have been elected directors of American Hoist.

Stone & Webster Officer

Fred W. Argue has been elected a vice president of Stone & Webster Engineering Corp., Boston, Mass. Mr. Argue, who became engineering manager of the firm in 1954, will continue to work in this capacity.

Mr. Argue joined the company in 1941, and was named assistant engineering manager in 1952.

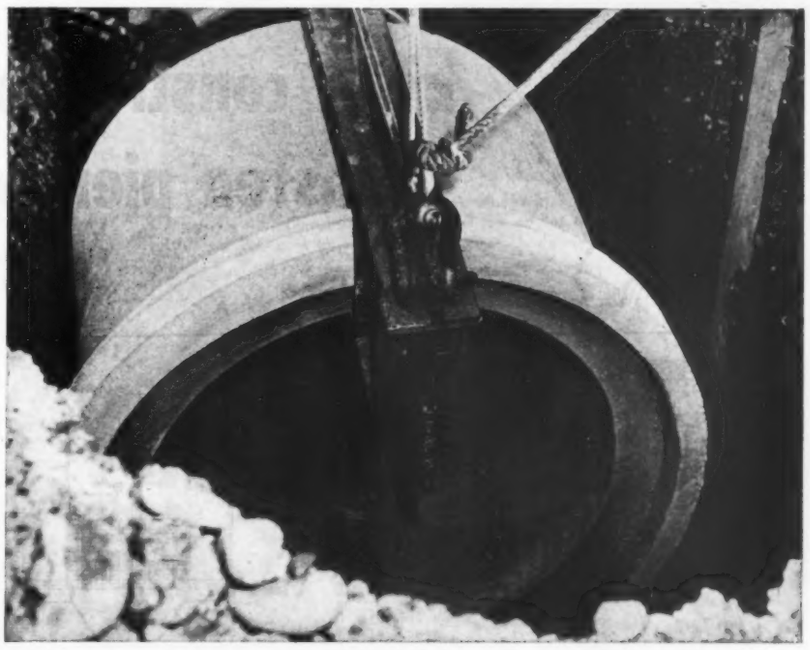
Australian Subsidiary Formed by Caterpillar

The third foreign company formed by Caterpillar Tractor Co., Peoria, Ill. since 1950 is Caterpillar of Australia, Pty., Ltd., a subsidiary which will manufacture and sell Caterpillar products in Australia.

Construction of the new 100,000-square-foot plant just outside Melbourne is scheduled to start shortly.

Caterpillar-designed earthmoving equipment already being made under license in Australia will now be manufactured under the control of the new subsidiary.

Mark A. Clements of Peoria will be the managing director of the firm, and J. Robert Hawk, a Caterpillar representative in Australia, will be sales manager.



PIPE SECTION made with Duraplastic Cement is lowered into ditch at Williamsport, Pa., sewage-disposal project. Engineer: Chester Engineers, Pittsburgh, Pa. Pipe supplied by Montoursville, Pa. plant of Concrete Products Co. of America, Subsidiary of American-Marietta Co.

For this Pennsylvania sewage-disposal project...

Here's why they chose concrete pipe made with Duraplastic*

LAYING PIPE made with Duraplastic Cement by crane—Contractors: Lycoming Construction Co., Williamsport, Pa.; O. H. Martin Co., Pittsburgh; Inter-County Construction Co., Hyattsville, Md.

REINFORCED concrete pipe made with Atlas Duraplastic Cement is a good choice for any job because Duraplastic-made concrete is more durable . . . offers greater resistance to the absorption and passage of water. Contractors can count on the advantages of Atlas Duraplastic air-entraining portland cement in concrete pipe just as they do in other types of concrete for construction.

IN STRUCTURAL AND MASS CONCRETE, the increased workability of Duraplastic-made mixes aids proper placement, improves surface appearance and fortifies finished concrete against freezing-thawing weather.

ON PAVING JOBS, Duraplastic Cement makes a more plastic, cohesive mix that dumps, spreads and finishes easily. Finishers can work closer behind the paver because Duraplastic minimizes bleeding. Paving made with Duraplastic Cement resists scaling caused by de-icing salts.

YET DURAPLASTIC COSTS NO MORE than regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, New York.

OFFICES: *Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.*

**"Duraplastic" is the registered trade-mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.*

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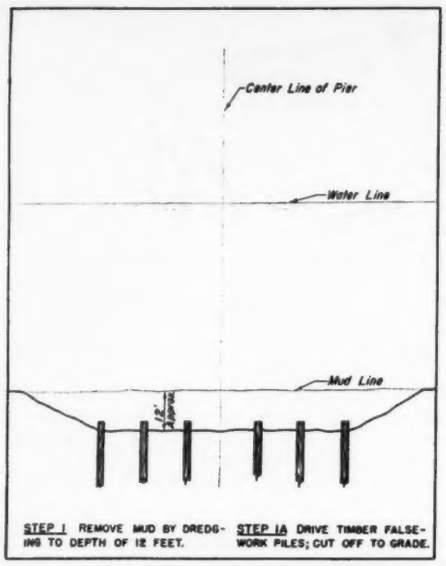
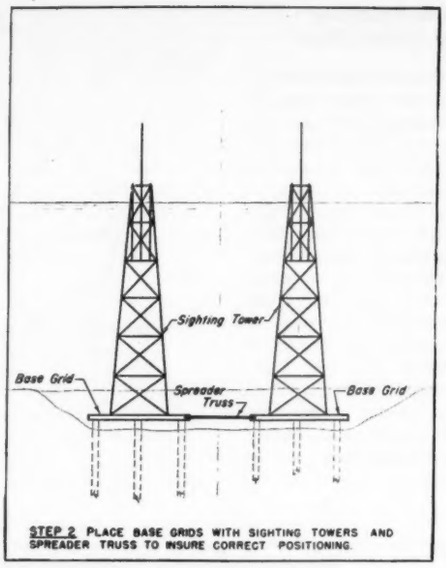
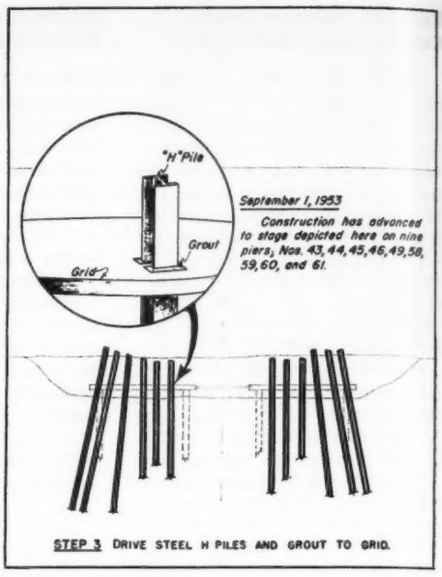


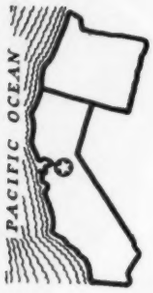
STEP 1 REMOVE MUD BY DREDGING TO DEPTH OF 12 FEET. STEP 1A DRIVE TIMBER FALSEWORK PILES; CUT OFF TO GRADE.



STEP 2 PLACE BASE GRIDS WITH SIGHTING TOWERS AND SPREADER TRUSS TO INSURE CORRECT POSITIONING.

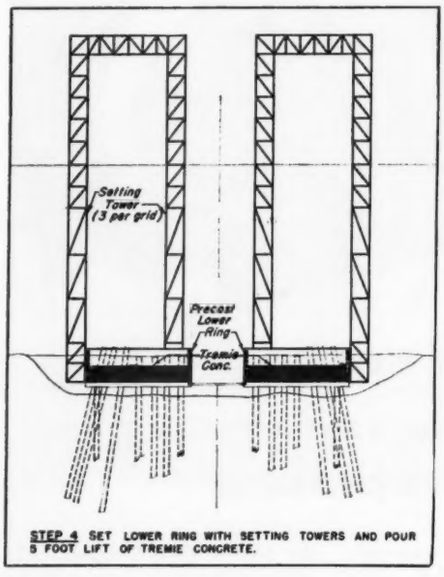

"H" Pile
Grout
Grid
September 1, 1953
Construction has advanced to stage depicted here on nine piers, Nos. 43, 44, 45, 46, 49, 58, 59, 60, and 61.

STEP 3 DRIVE STEEL H PILES AND GROUT TO GRID.

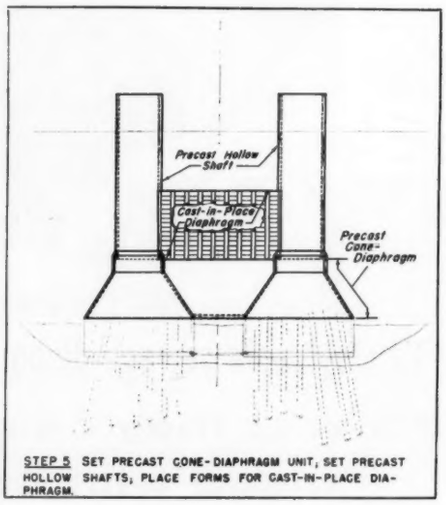


Eight construction steps hasten pier work on span

Pier shells are placed and filled with tremie concrete; method used puts bridge substructure ahead of schedule



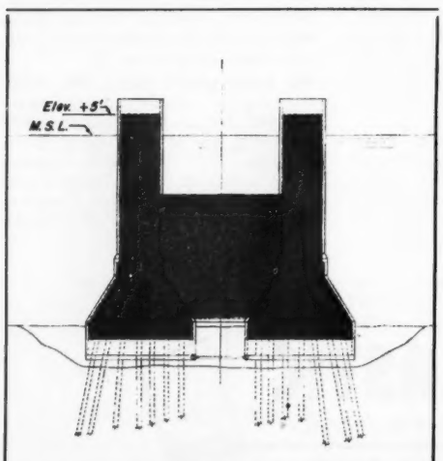
STEP 4 SET LOWER RING WITH SETTING TOWERS AND POUR 5 FOOT LIFT OF TREMIE CONCRETE.



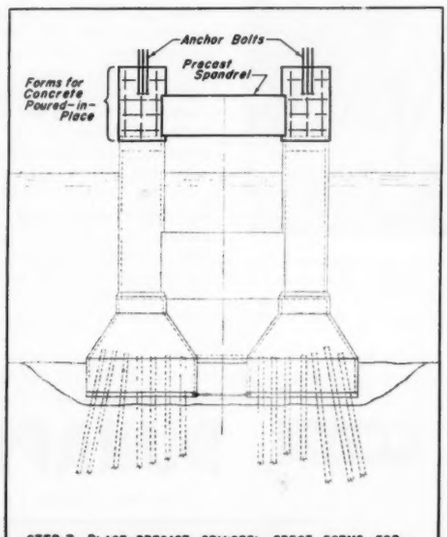
STEP 5 SET PRECAST CONE-DIAPHRAGM UNIT, SET PRECAST HOLLOW SHAFTS, PLACE FORMS FOR CAST-IN-PLACE DIAPHRAGM.

One of the most efficient applications of the precasting method—precasting pier shells and then filling them with tremie concrete after they have been positioned and checked for accuracy—is being used in substructure work on the Richmond-San Rafael Bridge across upper San Francisco Bay. The span, linking Richmond in Contra Costa County and San Rafael in Marin County, will be 5½ miles long, including approaches, and will span 4.01 miles of water.

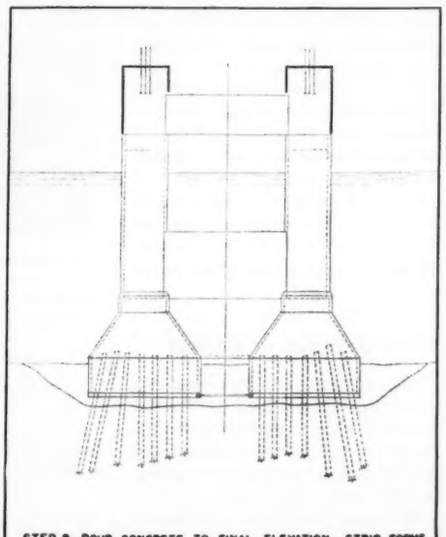
The adaptation of the precasting method originated with Ben C. Gerwick, Inc., San Francisco, Calif., and Peter Kiewit Sons' Co., Omaha, Nebr., joint-venture contractors on the $14,234,550 contract for the substructure. Both companies worked out details for the precasting method in cooperation with the engineers of the letting



STEP 6 POUR TREMIE CONCRETE TO ELEVATION +5 FT.



STEP 7 PLACE PRECAST SPANDREL; ERECT FORMS FOR SHAFT TOPS; PLACE ANCHOR BOLTS.



STEP 8 POUR CONCRETE TO FINAL ELEVATION; STRIP FORMS AND CURE. COMPLETED PIER.

Floating rigs make ready for a tremie pour in a pier shell jutting above the surface of the bay. Pours, averaging 100 cubic yards per hour, are carried forward on a round-the-clock basis.

Ray Day Photos

agency, the California Division of San Francisco Bay Toll Crossings. Since plans and specifications were concerned only with results to be obtained, the joint-venture firm had plenty of leeway to exercise ingenuity in methods of work on the substructure.

Difficult to Plan

The difficulties involved in bridging the bay at this point were immediately apparent. The bridge had to cross two ship channels which range from 50 to 60 feet deep. The bay has tidal currents which sometimes flow as fast as 6 knots, and these currents are distorted in several places by huge rocks which jut out along the bay. High winds frequently sweep across the water at this point.

Added to these unfavorable conditions was the fact that the bay floor consists of silt, gravel, and sand, and that foundation rock lies from 30 to 300 feet below this material. The job was made a little easier, however, after exploratory boring revealed a thick layer of coarse sand and gravel in areas where depth to bedrock was greatest. Steel H-beams, driven into this strata, could develop a 100-ton

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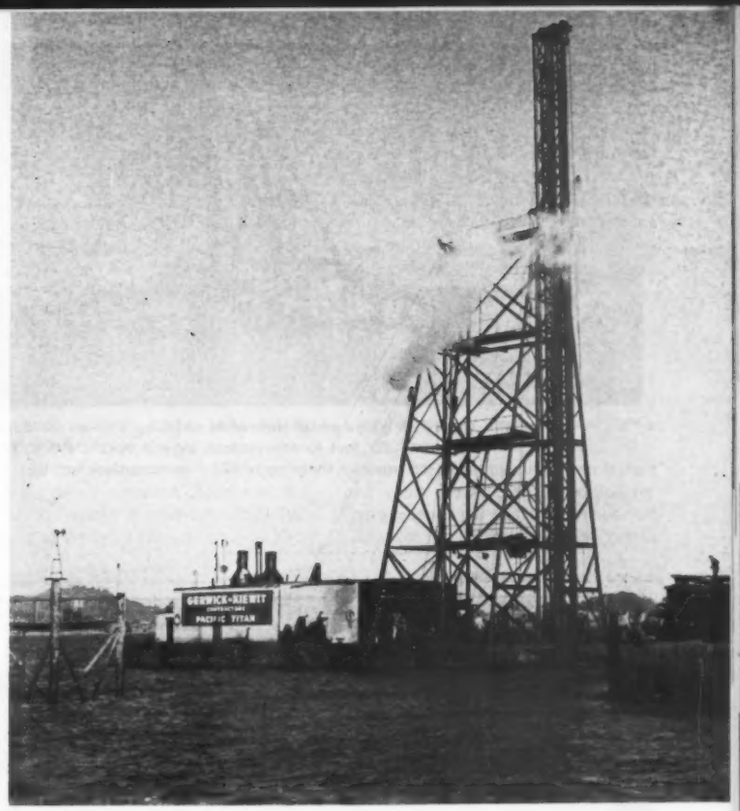

Using a McKiernan-Terry single-acting steam pile hammer, the Pacific Titan—one of two floating pile drivers built for the job—drives a long steel H-Beam to between 100 and 105-ton bearing in the hard strata beneath the bay.

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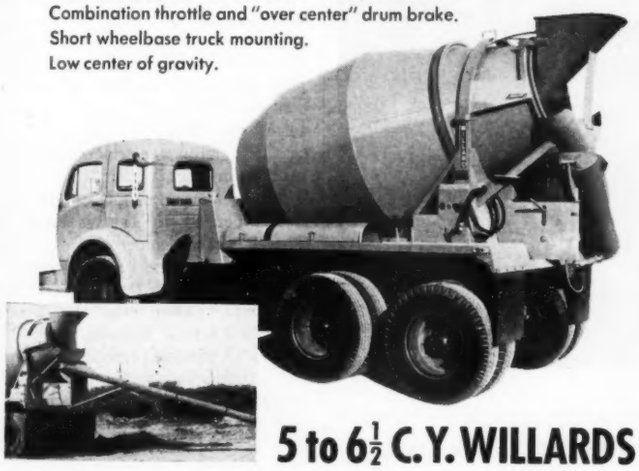

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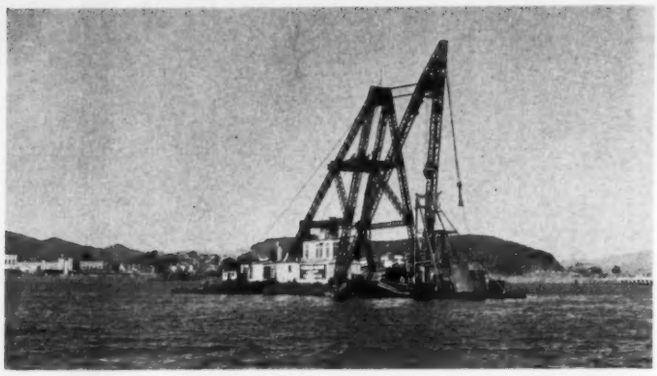

A derrick barge which sank after colliding with an oil tanker is raised 50 feet to the surface by the Pacific Atlas. This 150-ton-capacity shearleg is 125 feet from deck to jib.

(Continued from preceding page)

bearing capacity. These underwater conditions were thus similar to those found at the sites of the Potomac River and Chesapeake Bay Bridges on the east coast.

The foundation designed for the bridge consists of 62 bell-bottom-type piers, eight cofferdam piers, and nine land piers—all founded on steel H-piles driven into the hard strata. The contractors' decision to use the precasting method was based on the suitability and economy of the technique for the job. The Gerwick firm had gained experience in the use of prefabbed concrete shells when it built a transmission line crossing in South San Francisco Bay just before this bridge job was let. The firm is also a veteran at drydock construction, and had done a considerable amount of this type of work with precast units and tremie concrete filler.

A number of factors making for economy also favored the use of the precasting method. First of all, the Gerwick firm had a major concrete precasting yard already established at nearby Petaluma, in the navigable arm of the bay. This provided a good setup for casting sections quickly and at low cost. Use of this off-site construction facility would also tend to reduce congestion in the bay, a crowded navigable body of water. Here too, with work done in small standardized units, a number of large-scale operations could be eliminated. And the work could be done more safely, since the men would be more familiar with the smaller units.

Also giving an edge to precasting were the facts that construction over water is more costly, that precast sections would be heavy enough to lend stability to the placing operation despite wave or tide action, and that precasting assured the contractor of good concrete in the critical outer pile of shells, which would need a tough surface for exposure to sea water.

Long before the precasting operation reached its peak, a number of changes were made to perfect the operation. Construction of the piers is done in eight basic steps.

Steps 1 and 1A

Step 1 consists of preliminary work, including surveying, dredging, and driving temporary piles. Part of this substructure work requires a floating pile-driver to place a steel survey platform to one side of each pier location. The three legs of this platform are driven into the mud of the bay, close enough to the pier location to be used for accurate positioning of the pier. Each tower has 12-inch pipe legs with 10-inch telescoping columns set inside. While the platform was being constructed, the marker dolphin was driven by a floating pile driver.

The excavation of harbor mud and overburden to an average depth of 12 feet is also included as part of this step. This is done under a subcontract by Olympian Dredging Co., San Francisco, which uses the 2-yard clamshell dredge Holland.

Step 1A consists principally of driving wooden supporting piles in the excavated area to give temporary support to the heavy reinforced-concrete base grids after the timber piles have been accurately cut by an underwater saw to a predetermined elevation.

Step 2

This step centers around placement of base grids. Specifications provided that steel H-piles be entered through a template at the elevation of the pier base for accurate results, and that the pier base or grid be rigidly supported during the first concrete stages. This meant that the unit had to be precast in such a way that H-piles could be entered directly through the grid. Though there was some question regarding the feasibility of placing the tremie grout in the slotted openings around the H-piles, a considerable amount of trial and error proved it could be done.

During this step, the 1-foot-thick base grid is set down on the temporary wood piles. These had been

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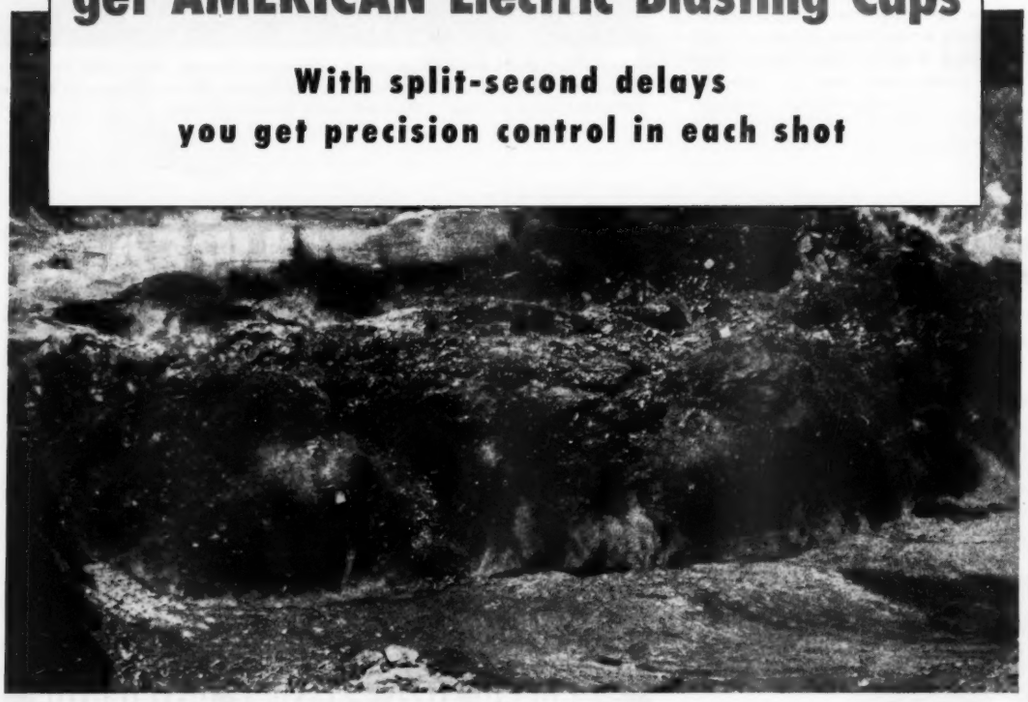

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sawed off to precise elevation by an underwater saw controlled from above the bay surface. Before they were placed, each of these base grids was equipped with a guide or sighting tower and a spreader truss so that accurate positioning was assured.

Step 3

This is the pile-driving step in which about 114 miles of 14-inch steel H-beams — or approximately 5,000 units—are driven. These H-beams, some of them more than 200 feet long, weigh 89 pounds per foot.

This step is complicated by a specification which calls for the orientation of piles along accurate radial azimuth lines measured from the pier center. To get this result, it is necessary to put a conventional Sperry ship gyroscope on each pile driver so that the radial locations can be reached easily and accurately. Since the job also calls for driving batter piles, it was necessary to start with the construction of special pile drivers which could handle the long units required.

Two identical pile drivers were built and, to simplify matters, named rather than numbered. On the Pacific Giant and the Pacific Titan are heavy-duty 150-hp boilers and extremely heavy donkey engines. Washington, American, and Clyde deck engines, and other special equipment so large that the contractors had to find the machines in the lumber and timber industry, are installed on both rigs.

Each of the pile drivers is built with a 120-foot set of leads to obtain the 2-to-12 and 3-to-12 batters shown on the plans. These leads also carry internal 120-foot telescoping leads which permit pile driving to be carried on as much as 80 feet under water. Each pile driver is also equipped with a McKiernan-Terry S-10 single-acting steam pile hammer. These, with individual blows representing 32,500-foot-pounds of energy, develop the 100-ton-plus bearing of each pile unit.

One of the two steam boilers of 150 to 200 horsepower placed on each rig was originally planned to serve as a standby unit. But when operations began, both boilers had to work most of the time to replenish the steam drained by the big pile hammer, various deck winches, and other machinery. Control of each pile driver is obtained through five lines secured to navy-type anchors. These were laid several hundred feet away in the mud of the bay by a derrick scow. The control lines include a head line, two quarter lines, and two stern lines.

In view of the difficulty of spotting the pile driver in high wind and swift current, pile driving performance is good. Both the Pacific Giant and Pacific Titan account for as much as 30 pile units in an 8-hour shift. Naturally, the highest production is attained on plumb piles shorter than the 200-foot-plus maximum length.

The piles are driven to a bearing value of between 100 and 105 tons each. In a few cases, the steel piles reached refusal and divers cut the tops off at precise grades with underwater cutting torches. This phase of the work also called for the slotted openings to be grouted under water so that concrete placed later would not run through the holes. After much experimentation, an old Gunite machine was rigged up with a valve-controlled underwater delivery system, and this allows the divers to place the grout speedily and skillfully. As a result, the slotted openings are grouted almost as well as if the job had been done on dry land.

Step 4

Now follows the installation of the precast lower ring which fits the top of the base grid. These lower shells range from 14 to 34 feet in diameter and 16 to 22 feet in height—depending on the pier concerned. After being picked up from delivery barges by a derrick barge, they are lowered into place with the aid of guide towers. At this time, it is important to develop a good concrete bond quickly on the steel H-piles sticking up through the base grid into this lower shell. This is done by placing tremie concrete to about half the total depth of each 9-foot lower shell. Placement of this concrete allows the steel piles of each pier to set up the necessary concrete bond so that construction loads can be carried.

Step 5

A precast cone diaphragm unit, the precast hollow shafts, and the forms for a cast-in-place diaphragm directly above the precast cone diaphragm are now set. The individual pier units are of such size and weight that they can be handled by a 150-ton shearleg crane.

The job is well staffed with extremely heavy crane equipment. Three such units on the job include a 75-ton barge-mounted American, a 50-ton barge-mounted Clyde, and the Pacific Atlas, a 150-ton shearleg. This heavy rig, mounted on a 65× 200-foot barge, is 100 feet from the deck to the main H-frame falls. From deck to jib point, it measures 125 feet. The machine, which frequently handles 45-ton lifts on its jib, also made lifts exceeding its 150-ton capacity by a small per cent.

This step brings the concrete shells up above the bay surface. Before the next step is taken, the top of the concrete portion of the pier has taken form.

Step 6

Tremie concrete is placed in the shells to a point 5 feet above sea level. These large pours are made on a round-the-clock basis, and the hourly production is 100 cubic yards. Altogether, 60,000 cubic yards of tremie and other field-placed concrete for the substructure has to be delivered and placed at 62 pier sites. Many such

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tremie pours average 2,500 cubic yards. A 4,000-cubic-yard pour on one of the cantilever pier bases required a 40-hour run to fill. The heavy concrete-placing setup work is handled by the Pacific Mixmaster. Essentially a high-capacity barge-mounted concrete plant, the Pacific Mixmaster carries a Noble automatic batch plant for concrete proportioning, a Link-Belt clamshell to handle necessary aggregates, a 1-yard Lorain Moto-Crane for hoisting mixed concrete to a Gar-Bro transfer hopper, and a Koehring Twinbatch dual-drum paver for mixing.

Also on the rig are a Chicago Pneumatic 315-cfm compressor for supplying air to gate rams, two 50-kw Caterpillar diesel electric sets, an electric-powered compressor which supplies air for bilge-water pumps, oxyacetylene equipment, Lincoln welding rigs, and the necessary deck engines for maneuvering the rig.

Bulk cement of 600-barrel capacity is handled by the cement silo on the Noble plant. The cement, brought in from Permanente, is hauled to the floating rig by a World War II LSM, converted especially for this work. The transfer between this unit and the Pacific Mixmaster's storage elevator is made by a small Hough Payloader.

For tremie concrete work, a 1-yard Gar-Bro bucket is used for the transfer. As a result of a field alteration, which uses two runner lines in a manner similar to the operation of a clamshell, the buckets are capable of being dumped directly by the crane operator. Ten-foot tremie joints with flanged connections are used for the tremie pours. The tremie pipes, handled by means of small air tuggers, are raised at exactly the right time so that the end of the pipe remains embedded and the formation of laitence is prevented.

Step 7

This step sees the erection of forms for shaft tops and placement of anchor bolts and the extremely heavy, solid, precast spandrel. Precasting of the spandrel member as a solid piece, and its installation by the Pacific Atlas saved a great deal of expense for carpenter work and supporting shores, which would have been required to hold such a heavy weight. A carpenter barge with power-saw equipment is used for building the necessary forms for shaft tops. With the exception of the spandrel lift, this is a conventional operation.

Step 8

This operation calls for concrete to be placed to final elevation, and covers final form stripping and concrete curing. This work is done by the Pacific Mixmaster and the other hoisting buckets and crane equipment. The piers are cured with water in places where tremie grout meets the shells. With the completion of step 8, the pier is ready for the superstructure.

Limited Use of Steel Shells

On eight of the largest piers, including the four-barrel cantilever tower, parts of the heavy base were so massive that precasting the outer shell was considered impractical. At these locations, the contractor adopted the use of steel shells. These shells were split into three divisions so they could be handled easily and accurately. Fabricated in the Napa, Calif., yard of Basalt Rock Co., Inc., the shells were barged to the job and lowered in place in exactly the same manner as the precast-concrete units. They were then filled with concrete by the Pacific Mixmaster, which followed the same procedure established for work on the precast-concrete shells.

Work Moving Rapidly

The contractors' crews are moving ahead rapidly on the work, and there is every indication that the substructure—scheduled for October 5, 1955, completion—may be finished by May, three months ahead of schedule.

Supervising the job for the California Division of San Francisco Toll Crossings is Norman C. Raab, projects engineer; Howard F. Topping and Louis J. Jennings, supervising bridge engineers; Oliver R. Bosso, supervising engineer; Ben Balala, construction engineer; and H. M. Eichstaedt, resident engineer.

General supervision for the contractors is under the direction of Donald B. Weaver, project manager. William J. Talbot is project engineer.

THE END

Caterpillar Revamps Western Dealer Setup

Effective the first of last month, the Caterpillar Tractor Co., Peoria, Ill., placed its new Northwest and Southwest divisions of its dealer administrative organization into operation. The new divisions were created by splitting the Western division. For the time being, both will maintain headquarters in San Leandro, Calif.

The change has resulted in a number of personnel shifts. The Northwest division is being staffed by J. A. Justeson, sales manager; Harrison Welch, service manager; Elwood F. Trantina, parts manager, and E. J. Schlegel, credit manager. Frank McNamara, E. P. Barta, and R. F. White are as-

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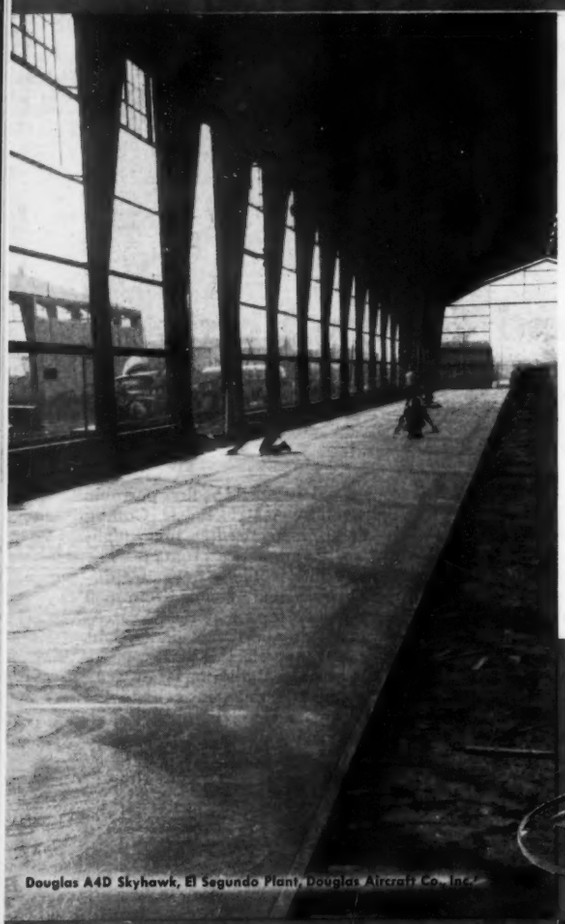

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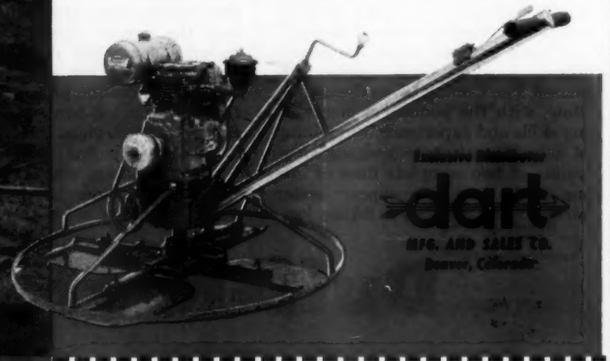

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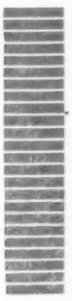

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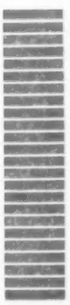

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sistant managers of sales, service, and parts, respectively.

Southwest division managers include Ben L. Hagglund, sales; Nick Kent, service; J. E. Ferguson, parts; and Robert Talbott, credit. Assisting them are Frank S. Foster, sales; R. G. Overpack, service; and J. F. Nullmeyer, parts.

The Northwest division now covers dealerships in southern British Columbia, Washington, Oregon, Idaho, western Wyoming, western Montana, and northern California. Southwest division dealerships will be those in central and southern California, Nevada, Utah, and Arizona.

Changes have also been made in the company's district offices. A. C. Kraft, representative in London, is now manager of the company's office in New York City. J. B. Wilson, former New York manager, is now assistant export manager of the Latin American Division. His offices are in Peoria, Ill. D. F. Shinn, representative in Stockholm, has become representative in the United Kingdom and Ireland. C. R. Poor, field engineer, is district representative in the Scandinavian countries.

Ferguson Promotes Two

The H. K. Ferguson Co., engineering and building firm of Cleveland, Ohio, has named Robert L. Cashen vice president and eastern district manager. He takes the post formerly held by W. N. Thompson, president. Norvon Clark, eastern district contract manager, has been made assistant eastern district manager for the company.

Mr. Cashen has been operational vice president of the company since 1951, during which time he supervised construction of refinery facilities for Standard Oil Co. of California at Richmond, Calif., and plants in Venezuela, Mexico, and Cuba. He joined the company as assistant general manager in 1945. Before that, he served seven years with the U. S. Army Corps of Engineers.

Mr. Clark has been with Ferguson for almost ten years, serving in a number of administrative capacities.

Mark Sagal Joins Diesel Construction Co.

Mark Sagal, formerly in charge of the construction department of Bing & Bing, Inc., New York, N. Y., is now engineer assistant to Carl Morse, executive vice president of Diesel Construction Co., Inc., New York City. Mr. Sagal's experience includes twenty years as engineer, superintendent, and construction manager on all types of construction for James Stewart & Co., New York, N. Y. He has also been associated with J. W. Bateson Co., Dallas, Texas, the Illinois Division of Highways, and the Missouri Highway Commission.

A civil engineering graduate of Cornell University, Mr. Sagal is a member of the American Society of Civil Engineers and the Cornell Society of Engineers.

Soundcraft Elects Officer

Homer W. Clapper, president of Bergen Wire Rope Co., Lodi, N. J., a subsidiary of Reeves Soundcraft Corp., New York, N. Y., has been elected an executive vice president of Soundcraft in charge of the Bergen Division.

The newly elected head of the Constructors Association of Western Pennsylvania, Allen D. McCombs.

Pennsylvania Association Elects 1955 Officers

Allen D. McCombs, president of the John F. Casey Co. of Pittsburgh, Pa., was elected president of the Constructors Association of Western Pennsylvania at the 21st annual meeting of the organization in the William Penn Hotel in Pittsburgh. He succeeds William R. McQuade, president of James H. McQuade & Sons Co. of Pittsburgh, as head of the association which represents heavy, highway, and railroad contractors in Pennsylvania's 33 western counties.

Elected vice president of the heavy division was Anthony A. Benintend of the Ben Construction Co., Pittsburgh; and vice president of the highway division, Edward McCrady, Jr., Edward McCrady, Jr., & Son Co., Pittsburgh. Charles H. Booth, Jr., Burrell Construction & Supply Co., New Kensington, Pa., was elected treasurer; Howard H. Sturdy, Dravo Corp., Pittsburgh, secretary; and Frank Mashuda of the Frank Mashuda Co., Milwaukee, Wis., assistant secretary.

Military Engineer Group Elects G. M. Serber

The New York City Post of the Society of American Military Engineers has elected Gilbert M. Serber president of the association for the current year.

Mr. Serber is president and managing engineer of the Stock Construction Corp., New York, N. Y., and has completed contracts for the Port of New York Authority, the New Jersey Turnpike, and the New York District of the U. S. Army Corps of Engineers.

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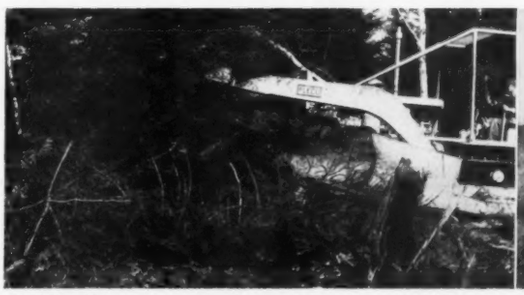

TREEDOZERS — A massive Knockdown Beam drives against the tree, applying tremendous leverage. A rugged V-plow dips below the big roots and lifts the tree from the ground. For use with Cat D8 and D7 Tractors equipped with double-drum cable control unit.

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One of the steel trusses which will be floated into place is assembled by a barge-mounted derrick at the fabrication yard at Richmond.

Aluminum trusses support steel erection for bridge

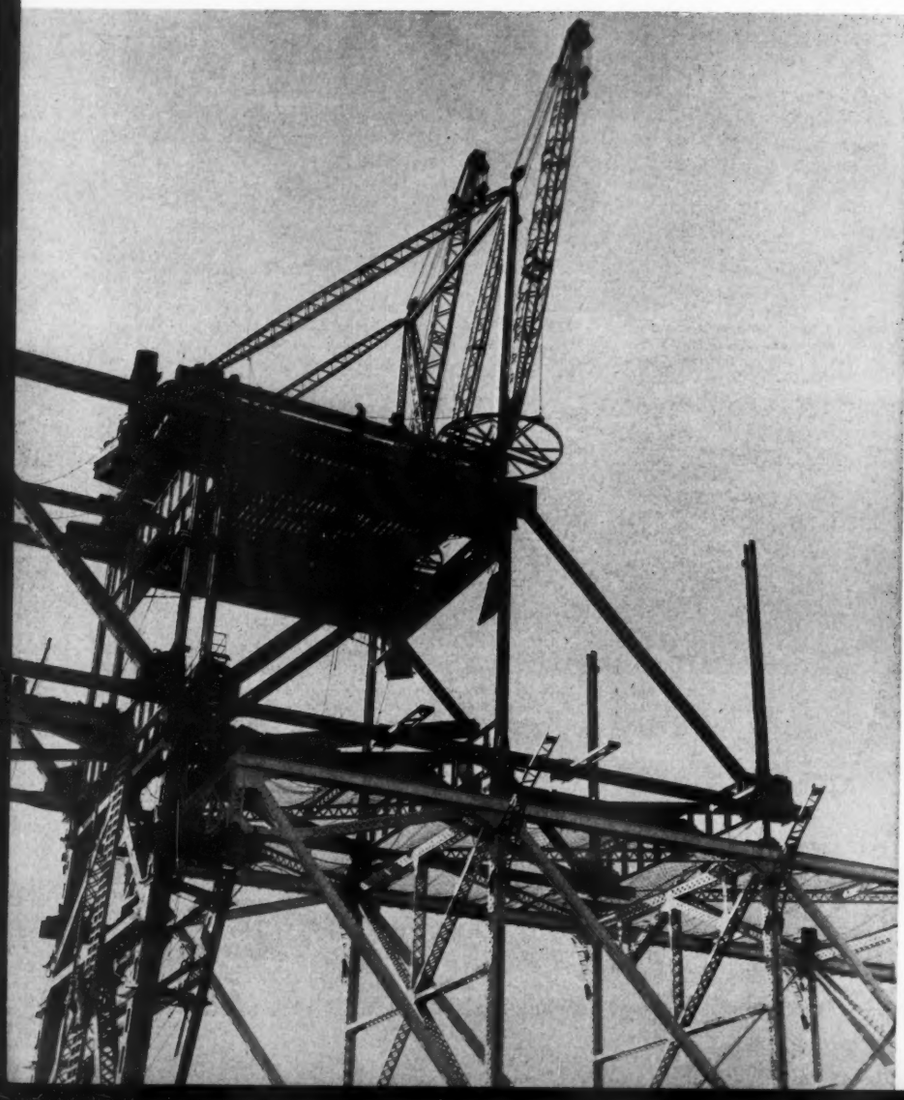
Trusses are shifted between alternate sets of piers; each carries 400 tons of steel placed by traveler

by RAY DAY

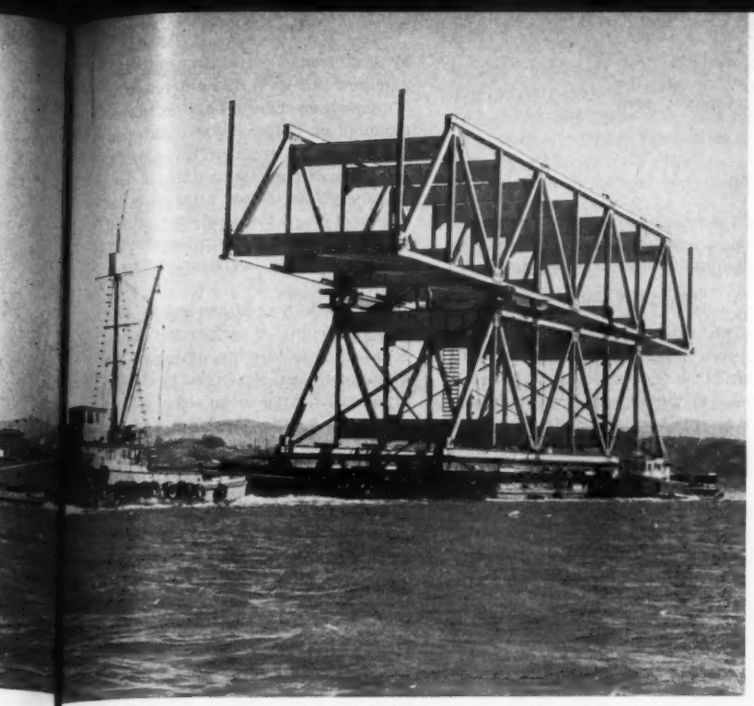
The second longest steel bridge superstructure in the U. S.—that of the Richmond-San Rafael Bridge across San Francisco Bay—is being erected largely on two structural aluminum trusses, marking what is believed to be the introduction of a new idea in bridge construction.

The lightweight erection trusses were designed by engineers of the Aluminum Co. of America who worked with the San Francisco, Calif., consulting firm of Earl & Wright. The idea for the trusses came from J. Phillip Murphy, president of Judson Pacific Murphy Corp., Emeryville, Calif., which, along with Peter Kiewit Sons' Co., Omaha, Nebr., has the $24 million superstructure contract with the California Division of San Francisco Bay Toll Crossings.

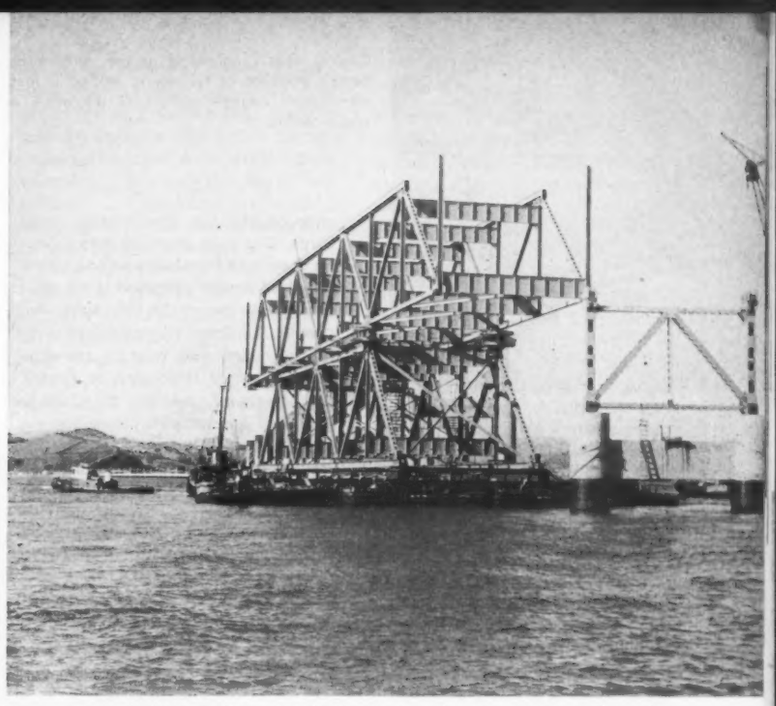
This first use of structural aluminum in heavy bridge construction is paving the way for an increased application of the method. Design problems—including variations in strength and expansion coefficient between aluminum and steel—have been solved satisfactorily on the project, providing the contractor with a good flexible structural erection setup. Sev-



The dual-boom traveler, built for this job by American Hoist & Derrick Co., erects upper and lower chords and post members.



A week later, the truss is finished and on its way to the erection site. Spans are floated into position where pier heights are not great and the bay is protected from wind and currents by land masses.



The truss is guided into position at high tide. As the tide ebbs, the truss will gradually be lowered into place. Then the barge will be filled with water until it floats clear of the truss.

eral erection combinations can now be used to develop optimum tonnage production from erection gangs.

Traditional Methods Changed

Under the two best-known methods previously tried in erecting structural steel for a truss-type bridge, members were assembled on some type of falsework-supported platform, and trusses were floated into position. This was the technique used on the Chesapeake Bay Bridge in Maryland and on Florida's new Tampa Bay Bridge.

But the use of this method on the 4.01-mile open-water stretch of the Richmond-San Rafael Bridge was ruled out by strong currents and heavy winds. The truss spans are 289 feet long, and some are as much as 170 feet off the water. Their weight, fully assembled, is about 400 tons, and this precluded using some of the permanent steel trusswork for the temporary erection platform. The sections were simply too heavy to lift economically.

Temporary pile bents were also impractical as far as falsework was concerned; the depth of San Francisco Bay would have required extremely long piles for that type of support falsework. One compromise was made with the floating-in method. Seven low-level truss spans on the Richmond side of the bay and two similar spans on the San Rafael side were floated in, since their erection on the special aluminum trusses would have forced part of the aluminum into the salt water, subjecting the metal to damaging electrolytic corrosion. But 27 truss spans are being erected on the aluminum framework.

The superstructure job calls for furnishing and placing 48,000 tons of structural steel. In addition to the bridge spans, there are 36 plate girder spans 100 feet in length, two 1,070-foot cantilever spans with 535-foot arms, a trestle approach, a mole fill, separation structures, and approaches on both ends.

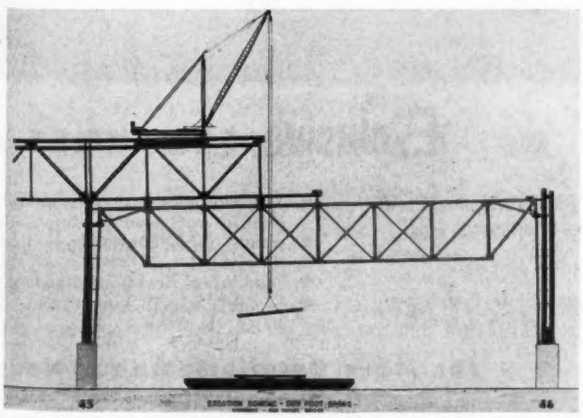
Fabricate Truss

To develop speed and flexibility in field operations, two aluminum trusses were built. These had to be light enough to be handled with conventional erection equipment already on the job. And they had to be strong enough to support the 400-ton dead loads of the steel trusswork assembly and the special dual-boom erection traveler made for the job by American Hoist & Derrick Co.

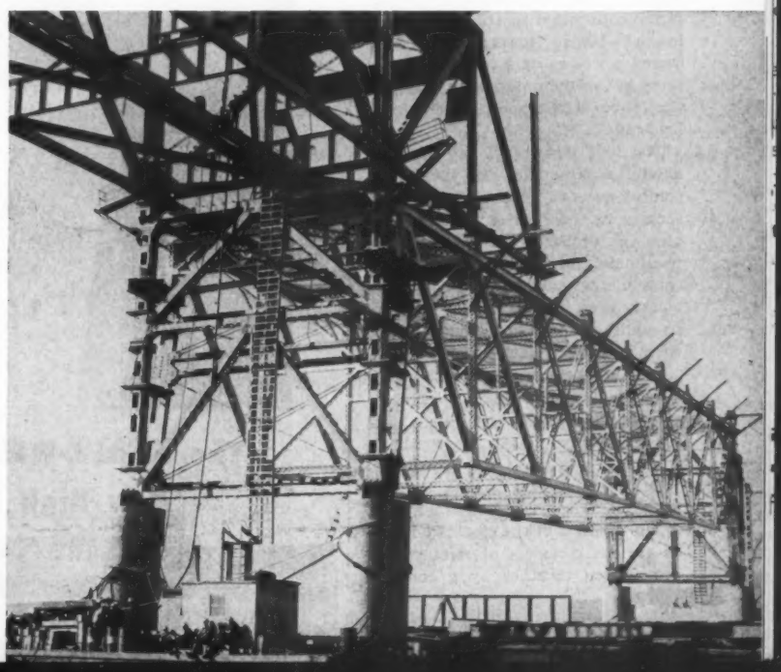
The use of aluminum falsework has cost only about $8 per ton of steel erected for the bridge as compared to amounts which run as high as $70 per ton for steel falsework, according to Murphy. The saving is due to the elimination of separate pilings for steel falsework and the erection of falsework bents.

Alcoa's plant at Massena, N. Y., the only mill in the world rolling many of the heavier aluminum channels and angles needed, filled orders for the units as engineers completed the structural design of the bridge. The two trusses, costing $150,000 apiece, were fabricated by Judson Pacific Murphy Corp. at its Emeryville plant. The consulting engineering firm chose to design the trusses as if they were to be permanent structures.

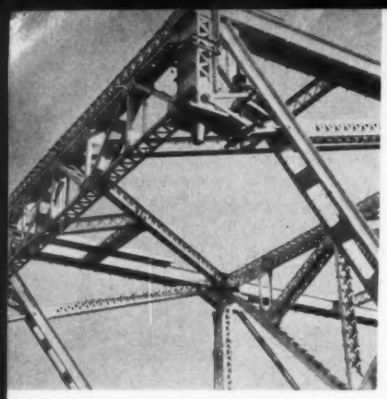
Though similar in design to steel trusses, these aluminum trusses are markedly different in some respects from those of steel. Specifications were drawn up for the highest strength aluminum alloy—14S-T6—a combination formed by alloying copper and other light metals with aluminum, then heat-treating the alloy. Steel weighs 0.28 pounds per cubic inch; aluminum weighs 0.10. Steel has a coefficient of expansion of 0.0000065 per degree F, while aluminum's coeffi-



Steel erection is carried from pier to pier by a specially built traveler as the 280-foot-long aluminum truss provides support for the 400 tons of steel which will span between the piers.



The aluminum supporting truss is placed and steel erection is being carried on from the pier at left. The aluminum trusses are light enough to be set in place by conventional equipment.



Conical seat connections at the corners of the aluminum truss permit 3 inches of leeway in setting it in place at the site. The connections engage sockets in the seats of shoes placed atop timber bents.

cient of expansion is only 0.000012 per degree. Aluminum's modulus of elasticity in tension and compression is only 10,600,000 psi, as compared to 30,000,000 psi in steel. Structural aluminum has a basic allowable tensile working stress of only 22,000 psi, which is arrived at from its minimum yield strength of 53,000 psi and its minimum tensile strength of 60,000 psi.

Ordinarily, structural aluminum is welded or fastened together with aluminum rivets. In this case steel rivets were used, chiefly because of their increase in shear value from 6,240 pounds to 9,020 pounds when compared with aluminum. The use of steel rivets added about 10 tons to the weight of each truss.

The riveting was particularly difficult because too much heat transference between the steel rivets and the aluminum alloy would have adversely affected the temper of the aluminum alloy. All stitch rivets in built-up members had to be spaced closer in aluminum than would have been necessary in a steel truss.

Each truss was built 36 feet deep, measured center to center between the top and bottom chords. The trusses were made by framing a top and bottom lateral system of structural aluminum. Permanent steel spans are spaced on 42-foot centers, and the truss facing the aluminum support member was designed on that same distance. The erection truss panels are 36 feet wide, the same width as the steel truss panels.

Timber supporting bents, designed to give vertical support, are being used to carry the aluminum erection spans. Lateral support is developed and bending moment eliminated by means of pin-connected shoes and a direct connection to the heavy steel in the bridge towers. Shear-lock beams, placed at the level of the upper chord of the aluminum truss, stiffened the timber bents against any lateral load also.

The four corners of the 280-foot aluminum truss have end shoes with conical bottoms. These engage similar sockets in the seat of shoes placed atop the timber bents. There is approximately 3 inches of leeway for the cone to enter this seat, so that it can quickly drop into its proper position. In addition to the cone shaped seats, there is a toggle device which can be used to move the end member 5 inches in either direction. If this 5-inch leeway is not enough, the high steel towers can be pulled a few inches with cables to make the connection. When one of the trusses is fully loaded it deflects as much as 9 inches.

The erection of the steel is unusual as various members of steel trusses are ganged together by a common shoe on the top of the steel tower bents. The only practical way it can be done is to start work at one of the five fixed anchor piers and move, span by span, to one of the split tower expansion joint piers. One operation requiring extra care is pin connecting the permanent steel truss to towers. This frequently requires the truss to be raised or lowered while the tower is being moved horizontally. The job is done with cables and six 150-ton jacks mounted on the aluminum truss work. To further complicate matters, the bottom chord of the steel truss is longer when it takes the dead weight of the truss assembly than it is when men are assembling its members on the aluminum erection span.

Flexible Erection Work

Fabrication of the two aluminum trusses has made extreme flexibility possible in the steel-erection schedule. The 117-ton weight of an aluminum truss can be handled by the dual-boom American traveler from the top of the steel truss work, or the aluminum framework can be handled by derrick barges working with the Judy Ann, a 50 × 160-foot floating derrick. This is a 100-ton stiffleg derrick, built by J. C. Theilacker, Milwaukee, Wis., and powered by a Washington Iron Works steam hoist. This derrick is mounted on a 48 × 51-foot fabricated steel tower 108 feet high. If necessary, the tower can be extended to 130 feet. The Judy Ann is used principally for the erection of the steel towers, and the dual-boom American traveler for the erection of superstructure truss work steel.

The erection sequence starts with the positioning of supporting bents, followed closely by the setting of the aluminum truss. For initial bents, the truss was floated in on a barge and picked up by the Judy Ann and the Daniel C, a JPM-K rig. As a steel truss is completed, the supporting aluminum structure is lowered. Then the American Traveler and the Judy Ann, handling opposite ends of the aluminum member, maneuver it between

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the next two sets of piers.

Erection Methods

In placing the steel, the traveler gradually moves out over the top of the bridge truss—which is supported by the aluminum underneath. As it does so, it places upper and lower chord members, the side posts, floor girders, and other parts which tie the steel trusswork together. Skid beams, placed on the upper floor beams of the steel truss system, permit the traveler to move ahead. The company has worked out advance erection diagrams for each bent so that each piece is placed in the structure in proper order. These schedules are even arranged so that the responsibility of each boom on the traveler and each erection gang is clearly outlined.

Before the steel truss in any span can be freed to support its own weight, all the lower chord rivets have to be in place and accepted. From 50 to 90 per cent of the remaining members also are riveted before the trusses are turned loose, and every other hole is either bolted or pinned preparatory to driving the final rivets.

With this done, the steel span is ready to be swung on its pin connection. Making this pin connection is a complex and dangerous operation since it involves a vertical movement of the steel truss on 150-ton roller-mounted jacks, along with cable pulls on the towers.

Horizontal adjustment is made by the toggles on the aluminum erection span. These toggles, which have maximum possible movement of 5 inches, plus or minus, push or pull the tower into proper position by reaching through the wooden support bents.

When this connection has been made, the aluminum toggle is loosened and the steel bent takes over under its own weight. The erectors are extremely careful not to tie the aluminum support framework to steel members, either for extended periods of time or during sudden temperature changes. The variations in expansion between the two materials could cause serious damage to the aluminum.

The steel span is turned loose by slowly relieving the jacks which give it vertical support. When the steel takes its full load, its center point assumes a camber of about 11½ inches above the same point unloaded. At the same time, the movement of the aluminum truss is reversed. Before the aluminum support truss is removed, a steel safety net is suspended underneath the newly erected steel truss, so that riveting gangs and other workmen can work on it in safety.

Nine Spans Floated In

Nine low-elevation spans were floated in to prevent electrolytic damage to the aluminum truss members by salt water, even though the aluminum was protected by zinc chromate and aluminum paint. A secondary reason for the adoption of this method was the fact that parts of the low-level bridge on both the Contra Costa and Marin county sides had some protection from wind and waves by land masses which jutted into the bay.

Judson Pacific-Murphy picked a large site for the main fabrication yard at the foot of 26th Street in Richmond, Calif., in a sheltered arm of San Francisco Bay. Large acreage here made it possible to bring structural steel in from many points. Some of the steel came from as far away as Los Angeles, where Consolidated Western Steel Corp. subbed part of the fabrication work. The large yard permitted an orderly flow of structural steel for assembly.

A large part of this yard was given over to the fabrication of the nine truss members which were floated into position. A heavy-duty derrick barge, moored to the shore, was used for the fabrication work, together with four barges tied together by cross members. The barges were arranged so that they could be made to ride high or low in the water by pumping water out or in. This flexibility, coupled with precise timing of floating-in operations, made it possible for the trusses to be floated into position on schedule.

A truss floated into position was assembled in about a week's time on a short span of permanent structural steel, which is to be used later in the completed bridge. As the truss left the yard under the tow of three tugs, 100 per cent of the rivets in the bottom chord had been driven and 50 to 90 per cent of the upper chord and other tie members were in. Radios crackled constantly to tie the operation together, for when the truss left the Richmond yard the wind was blowing at 23 mph and the prediction was for even higher winds. Fortunately, the wind died down in late afternoon and the span was floated into place and set accurately in position as the tide ebbed. The four barges were then pumped partly full of water to get them down in the clear. Erection of the nine spans was completed on a basis of one per week.

Spectacular as the floating-in method is, the erection of structural steel on the aluminum spans still ranks as the most dramatic part of the Richmond-San Rafael superstructure job. Future bridge men are likely to recall that this project marked a revolutionary step in bridge building.

Personnel

Full credit for the unique aluminum idea goes to J. Phillip Murphy, President of Judson Pacific-Murphy, in whose mind the idea originated. In the field, Francis J. Murphy is project manager, and H. W. Ziegler is erection superintendent. R. A. Chisholm is general superintendent of yard operations, and W. E. Dreusike is office engineer. For the California Division of San Francisco Bay Toll Crossings, Norman C. Raab is projects engineer; Ben Balala, resident engineer; and Howard Whitty, resident engineer in charge of steel erection.

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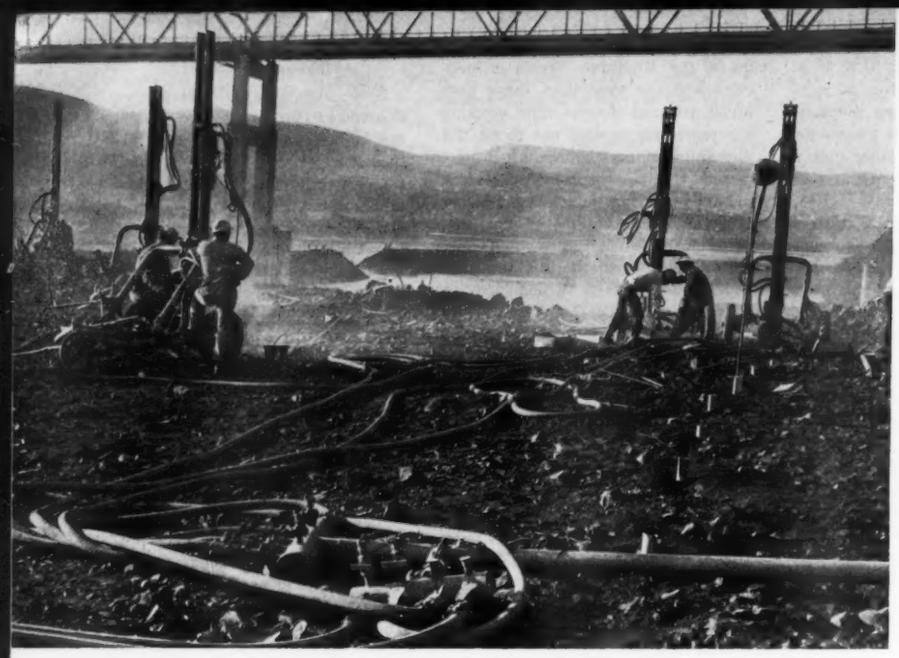

Gardner-Denver wagon drills prepare blasting holes on the excavation prism of The Dalles Dam navigation lock on the Columbia River. The bridge in the background, built recently by Wasco County, Oreg., was designed to allow sufficient clearance for lock walls. *Ray Day Photos*

Hard basalt formation under The Dalles Dam site requires precision drilling and blasting for 180-foot-deep cut

Navigation lock poses problems in excavation

About 100 miles upriver from Portland, Oreg., on the Washington shore of the Columbia River, one of the most precise excavation jobs undertaken in that territory in years is in progress. Consisting of drilling and high explosives work, it is designed to cut badly fractured basalt rock to form the high vertical walls of the river navigation lock being constructed at the site of The Dalles Dam. (See "Multipurpose dam for the northwest", C. & E., March, 1954, pg. 36.) Atkinson Ostrander Co., The Dalles, has the $12,708,179 Corps of Engineers contract. Included in the project is the construction of the complete navigation lock, the north non-flow dam, and the north fish ladder.

Started September 24, 1954, the job is set for completion October 1, 1956. The navigation lock excavation has got off to a running start with some improved working methods, especially in drilling.

What make the excavation so difficult are the old basalt flows which form the bedrock under the dam. Some of these flows, separated by as much as a thousand years in time, have heavy lenses of dirt, mud, and petrified wood where forests once grew. Much of the basalt rock is highly vesicular, and massive shrinkage cracks are common. This has tended to complicate the excavation job, so far as rapid drilling and the accurate cutting of vertical walls are concerned.

The main navigation lock measures 86 feet wide by 675 feet long, and calls for a maximum excavation cut of 180 feet. This navigation lock will provide a 90-foot lift to transfer Columbia River traffic between the old river level and the new reservoir level behind The Dalles Dam. The navigation lock will, of course, be complete with guide walls and guard walls upstream and downstream, and with heavy steel gates at each end of the lock chamber. These gates, which also are part of the contract, are being manufactured by Todd Shipyards Corp. in Seattle.

Principal items in the contract include 911,000 cubic yards of excavation, of which 850,000 cubic yards is in basalt rock. There is also 195,000

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Powder men load a long row of holes, using Olin explosives and Western Minimax delay caps. Blasting the basalt rock on this Columbia River project was one of the trickiest pieces of shooting ever attempted in this part of the country.

Broken basalt rock dislodged by the blasts is loaded to a Euclid 16-yard end-dump truck by a Bucyrus-Erie 120-B shovel. Part of this material is used in the cofferdam, but a large share will be used in fill areas around the dam.

cubic yards of reinforced concrete in the job.

River Protection

One of the first orders of business when excavation began was to provide high cofferdam protection for the work area. The upstream portion of the navigation lock ties to high ground, and no cofferdam is needed. The main need was for a cofferdam to keep river water from running back into the navigation lock area from below.

This cofferdam was built rapidly, using blasted rock and light overburden which was dug in the initial navigation lock excavation stage. Maximum depth of water where this material was dumped was about 30 feet. Two Bucyrus-Erie shovels—a 120-B and an 88-B—loaded a fleet of Cummins-powered Euclid trucks for this operation. The cofferdam was started simultaneously from both shore points and was carried out to a center closure point with the help of a D8 bulldozer. On the initial dump, the fill was put in approximately 15 feet higher than the level of the Columbia River, in water up to 32 feet deep. A portion of this cofferdam will be enlarged to create the rockfill guard wall along the lower river side. Ultimately this rockfill guard wall will be 50 feet wide across the top and will reach to elevation 102, referred to mean sea level.

In addition to this main cofferdam, Atkinson Ostrander plans to get absolute high-water protection with a rolled earth-fill dike reaching between the lock wall and the guard wall downstream, building to a maximum height of elevation 102. That will permit spring and early summer work to continue in this area even though the Columbia River is high.

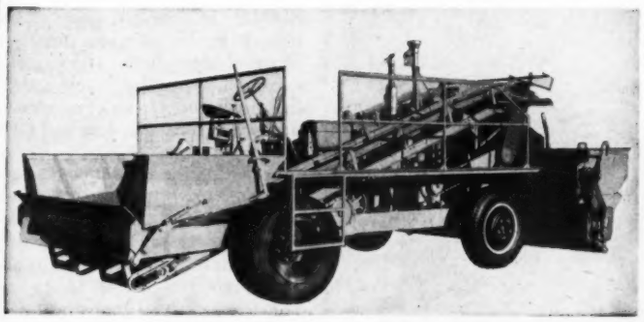
Drilling and Shooting

Over a long period of time, the contractor's officials have learned that 18-foot banks of broken rock give optimum production for their power shovels. The usual way to drill an 18-foot hole is to start off with a

ENGINEERS and CONTRACTORS

are hailing The Revolutionary

"SPREAD-MASTER" Power Spreader



. . . the only modern self-propelled chip spreader on the market!

Spread cover coat material the modern way . . . it's easier, faster, more economical and superior in results! Two-man crew can make spreading continuous operation—no drag or brooms needed . . . just one straight line of uniform application. Tighter, more uniform mat is achieved by placing larger chips in asphalt first, fines on top. When rolled, choice chips then are keyed and wedged in place. Also ideal in road sanding for ice-control and sand-sealing.

New improved SPREAD-MASTER has 57 hp unit, heavyduty power steering assembly, double-acting mixing auger, trouble-free material shut-off gate in front hopper and streamlined, sturdier construction.

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DIGGING CAISSON PIER HOLES
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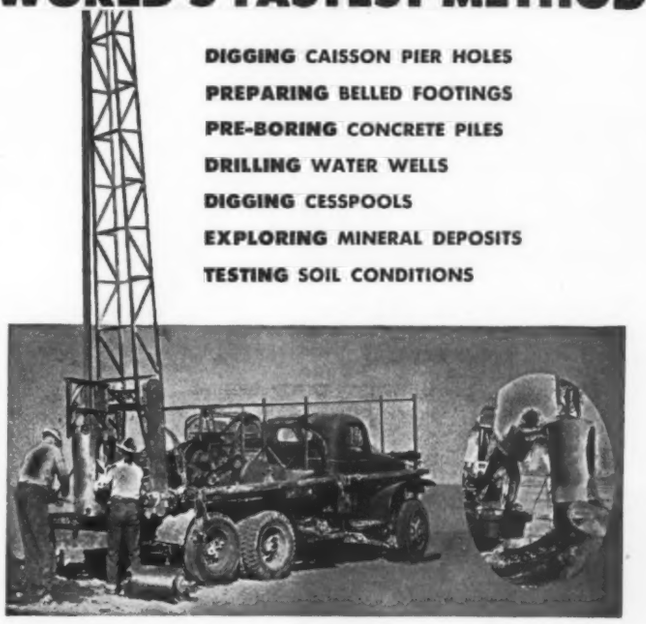

DRILLS 84" DIAM. HOLES 200' DEEP

A TWO MAN CREW, using the Calweld Model 150-A Earth Drill can complete as much as 250 feet of 36- to 48-inch diameter hole in an 8-hour shift. Equipped with specially designed interchangeable buckets, earth drilling operations can be stepped up through every type of subsurface formation. Calweld Model 150-A drills holes as deep as 200 feet and in any diameter ranging from 16 to 84 inches. Entire unit is built on skid frames to allow convenient mounting on any two-ton or larger truck. Rig can be easily moved and set up to quickly complete multiple bores with a minimum of lost drilling time. You get more hole faster with Calweld Earth Drills. Get all the facts; write today for complete information.

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CALWELD BUCKET TYPE EARTH DRILLS

6-foot piece of steel, then change to a 12, and then to an 18. The limiting factor in this operation is the height of the mast on wagon drills. That has now been changed by raising the clear mast height to 10 feet, either on the job in the main shop, or at the factory supplying the machines. When a fleet of new Gardner-Denver wagon drills was recently ordered for this work, the increased mast height was taken care of at the factory. What this change did was to eliminate many man hours of labor by permitting the 18-foot hole to be drilled with only two steel lengths: a 9-foot starting piece and, later, an 18-foot piece.

The company's drilling equipment includes 16 Gardner-Denver 99-R wagon drills and four Joy 400 wagon drills. With the exception of about five rigs which have the old short mast for some close-in work, all the machines have the higher clearance. Compressed air power is centered in a permanent building and includes four electric-powered stationary Gardner-Denver 600-cfm machines, an Ingersoll-Rand 3,000-cfm stationary machine, and a Chicago Pneumatic 3,000-cfm machine. Part of this 8,400-cfm total is diverted for use on the spillway, but a large share of that supply goes to the wagon drill fleet.

Drilling this basalt formation with ordinary rock bits was completely out of the question because some of the material was so hard that ordinary rock bits burned up in about four inches of travel. All drill bits on the job, therefore, are tungsten carbide. They include three types: Timkens, Ingersoll-Rand Carset bits, and Brunner & Lay Rok-Bits. Brunner & Lay 1¼-inch steel also is being used.

The job was hardly started before drilling superintendent Ted McDaniel's crews ran into serious trouble. One of the first formations they found was a large pocket of faulty material. It was dirty, badly broken, and nearly impossible to drill. The air hole in the round steel kept plugging up, and drilling speed dropped to as low as three 18-foot holes a shift.

Fortunately, someone remembered a spare set of Gardner-Denver hexagon 1¼-inch steel of high-alloy construction and superior strength. One set of this steel had been brought to the job on an experimental basis to see how it would work in hard rock. Since this steel also makes use of a special needle-type connection between the wagon drill and the steel's air channel, there was every reason to believe that it might be superior in the soft but extremely tricky formation.

The hexagon steel provided the answer to the problem. On the first day it was tried, the wagon drill using it produced 25 18-foot holes, compared to 3 for some of the machines working nearby with ordinary steels. Five extra sets of this special Gardner-Denver steel were ordered immediately to hurry the drilling through the remainder of the bad formation.

Blasting

For mass blasting in the heavy part of the excavation prism, a 7×7-foot hole pattern seems to be best. The vertical sidewalls, on the other hand, are being formed by drilling a line of close holes on 24-inch centers—a procedure which breaks the rock out exactly where it's supposed to stop.

Because of the seamy nature of the basalt, about ¾ of a pound of powder per cubic yard is required to get the proper breakage. The holes are being barrel-loaded with Olin powder and the shots are being pulled with the help of Western Minimax delay caps up to No. 10. The close-hole line drilling along the sides is not being done until after the center shot is pulled. After each shot, any loose rock sticking to the sides is promptly scaled off so that the channel will be safe when the job reaches the concrete forming stage. By staying 12 to 15 feet away from the sidewalls with the preliminary blast, crews protect sidewalls which will have to hold vertically until the 4-foot navigation lock walls can be formed and the concrete placed. A tolerance of 2 feet beyond the neat line is allowed for pay purposes under Corps of Engineers specifications.

A Bucyrus-Erie 120-B, an 88-B, and a Northwest 80-D shovel are used to load out the broken material. The hauling fleet includes 16 Euclid end-dump trucks of 16-yard capacity, powered by 300-hp Cummins diesel engines. There are also four Caterpillar D8's on the navigation lock excavation for miscellaneous jobs.

Part of the material is being disposed of in the cofferdam, but a large share will be used to make permanent fill areas around the dam and electrical switchyard.

Included in the excavation item are some particularly tricky pieces of rock removal. Some of the filling trenches are 32 feet deep and 20 feet wide, and have vertical sidewalls. There is approximately 100 feet of 24×40-foot tunnel to drill. This tunnel will hold a double-barreled reinforced-concrete culvert for filling the lock chamber. The most painstaking kind of drilling and shooting is the rule here, and concrete work is expected to start sometime this spring.

History

Contrary to popular opinion, construction of The Dalles and other dams along the Columbia will aid rather than hinder river transportation. Construction of the navigation lock at The Dalles Dam actually marks the fourth definite stage of development in the interest of navigation at that point.

Prior to 1863, the link between boats operating on the upper river above Celilo Falls and those with their terminal at The Dalles was an old wagon portage road. The second navigation stage was inaugurated in the spring

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15 tons as a Crane

★ Greater Crane lifting and working capacities.
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GENERAL PURPOSE ¾-YD.
Up to 12 tons as a Crane

This general purpose ¾-yd. machine is a real speedster, readily adaptable to all-around ¾-yd. service. Fully convertible to 5 front ends. The crawler is 12'6" long. Now available as a crane with lifting capacities of 10 and 12 tons.

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HEAVY DUTY ½-YD.
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This is your best buy in the ½-yd. class — as great a value as the "26". Includes the new fatigue-reducing, output-increasing Lorain "E-Z" operating controls. Now available in crane capacities of 8 and 10 tons.

Here's a heavy-duty ¾-yd. machine any way you look at it! From its newly-designed, 2-speed crawlers to its new longer booms for even greater operating ranges . . . with its greater weight and increased power . . . it's a real "workhorse" for the toughest kind of ¾-yd. service. Check this partial list of new features and decide now to see your Thew-Lorain Distributor for the full facts.

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THE THEW SHOVEL CO., LORAIN, OHIO

of 1863 when the Oregon Steam Navigation Co. completed a 13-mile iron-railed portage line along what previously had been known as Thompson's Portage between The Dalles and Celilo Falls on the Oregon shore.

Increased traffic, especially on the upper river, soon justified the construction of The Dalles-Celilo Canal, which went into operation in 1915 at a cost of $4,840,000. Today that old navigation project of 1915 is obsolete, but it continues to function throughout most of the construction stages of The Dalles Dam project. Completion of the navigation lock by Atkinson Ostrander is expected to solve river navigation problems at that point for many years to come.

THE END

Charles S. Whitney Elected Head of ACI

The president of the American Concrete Institute for 1955 is Charles S. Whitney, a partner in the consulting engineering firm of Ammann & Whitney, New York, N. Y., and Milwaukee, Wis. Mr. Whitney, elected at the 51st annual convention of the organization at the Hotel Schroeder in Milwaukee, succeeds Professor Charles H. Scholer, head of the department of applied mechanics at Kansas State College, Manhattan, Kans.

A graduate of Cornell University with a master's degree in civil engineering, Mr. Whitney has been associated with Gustave Lindenthal, New York, N. Y. and John Parkinson, architect, Los Angeles, Calif. After serving in the U. S. Army Corps of Engineers during World War I, he was chief engineer for A. C. Eschweiler, Milwaukee, Wis., architect, and chief engineer and manager of the Milwaukee office of Hool & Johnson, engineering firm. Since 1922, he has been a consulting and designing engineer, specializing in city planning, design and supervision of buildings, bridges, sewer and water systems, and other projects.

Holder of the ACI Wason Medal and the Alfred E. Lindau award, Mr. Whitney also was awarded the Fuertes Graduate Medal of Cornell University twice and the American Society of Civil Engineers' J. James Croes Medal. He served as vice president of the American Concrete Institute in 1953, and has held positions on a number of the organization's committees.

Walter H. Price, also active in committee work, is vice president of the institute. He will serve a two-year term. Mr. Price is a civil engineering graduate of Tulane University and has been with the U. S. Bureau of Reclamation since 1930.

Guide Is Published On Garden State Parkway

An illustrated guide to points of interest along New Jersey's Garden State Parkway, listing estimated driving time and toll charges between points, has been published by the New Jersey Highway Authority. The leaflet also contains general information about points of interest along the 165-mile route.

Copies may be secured, without charge, by writing the Public Relations Office of the Garden State Parkway, which is located at 12 Broad St., Red Bank, N. J.

Former Korean Engineer Assigned to Duty in U. S.

Col. Jack L. Coan has been reassigned as executive officer for the Missouri River Division of the U. S. Army Corps of Engineers at Omaha, Nebr. For the past 16 months commander of the 36th Engineer Combat Group, engaged in rehabilitation in Chorwon-Kumwha sector of central Korea, Col. Coan will now serve under Brig. Gen. W. E. Potter, Missouri River Division Engineer. He succeeds Col. Philip Y. Browning, who has been assigned to duty in the Far East.

Col. Coan, in the regular army since 1937, is a holder of the Legion of Merit, Bronze Star Medal, and Croix de Guerre.

Col. John L. Wilson, Jr., who returned from Europe to the U. S. recently from his assignment as Engineer, Western Area Command, is now district engineer of the Corps of Engineers at Rock Island, Ill. He succeeds Col. Nelson Leclair, Jr., who is retiring from active service. Col. Wilson, a reserve officer since 1926, has served tours of duty in the Philippines and Japan and has held a number of posts in this country.

Two New York Engineering Societies Effect Merger

The merger of the Structural Engineers Society of New York and the New York Association of Consulting Engineers has been effected. Since the organizations have practically the same membership requirements and codes of professional practice, and since both have been active in the professional and ethical development of engineering in the New York metropolitan area, the merger will result in a stronger organization by eliminating duplication of effort.

An organization of licensed professional engineers, The New York Association of Consulting Engineers was organized in 1924. Founded in 1928, the Structural Engineers Society of New York has been engaged in bettering the profession's public relations.

Goodyear Promotes

Robert C. Stranahan has been promoted to the position of manager of merchandise distribution for the metal products division of Goodyear Tire & Rubber Co., Akron, Ohio.

In addition to being in charge of distribution, Mr. Stranahan will coordinate sales and production for the plant. He succeeds C. E. Zarth.

"Completely Satisfied"

with LIPPMANN equipment

at K. L. Dunbar Slag Company

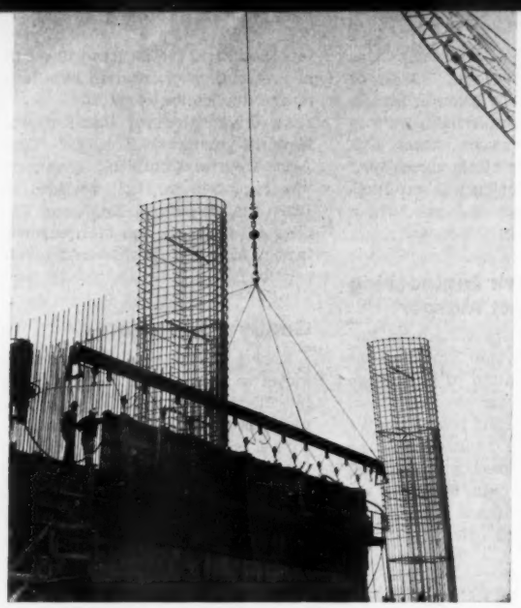
THIS SLAG-CRUSHING PLANT in Pennsylvania processes 400 tons per hour. Maximum feed size is 18 inches and the 24″ x 36″ Lippmann "Grizzly King" Jaw Crusher is set at 3″—a 6 to 1 reduction. Mr. Dunbar says, "occasionally a piece of slag with high metallic content gets past the pickers, but except for a couple of GRUNTS when this happens, the crusher makes no other complaints."

He further states, "during the five months it has been in service, it has required no adjusting or servicing except for lubrication, so naturally we are *completely satisfied* with this kind of production and uninterrupted service. Except for the first cost, we wouldn't know the crusher was there. I might say in passing that the three Lippmann conveyors are giving the same kind of trouble-free service."

You, too, like so many others, can look to Lippmann-engineered equipment for those extras in performance that mean more production and lower costs. See your Lippmann dealer or contact Lippmann Engineering Works, 4637 W. Mitchell St., Milwaukee 14, Wis.

LEW LIPPMANN

CRUSHERS FEEDERS SCREENS CONVEYORS CRUSHING & WASHING PLANTS



Ten pickup points are used as this Blaw-Knox steel form panel is picked up by a Clyde Whirley crane using a lifting beam. Towers of reinforcing steel rise in the background.

The heavy continuous steel form spanning the full distance between bridge piers eliminates the intricate and costly falsework usually required for bridge deck pours. The Clyde Whirley placed the form and will handle concrete for the pour.

Spillway crews utilize efficient pour methods

Forms are detailed 1,000 miles from job, then modified slightly for progressive in-line placement of concrete

by RAY DAY

Improved concreting methods which are lowering construction costs and boosting job efficiency have been introduced by Atkinson Ostrander Co. on the $14,437,978 Corps of Engineers contract for The Dalles Dam spillway.

Two innovations in heavy-concrete construction characterize the operations of this joint-venture firm. Complex form detailing, which requires more engineering than carpenter know-how, has been centered in the South San Francisco office of Guy F. Atkinson Co., nearly 1,000 miles away from the job site at The Dalles, Oreg. A secondary by-product of form detailing is the more or less automatic scheduling of concrete pours.

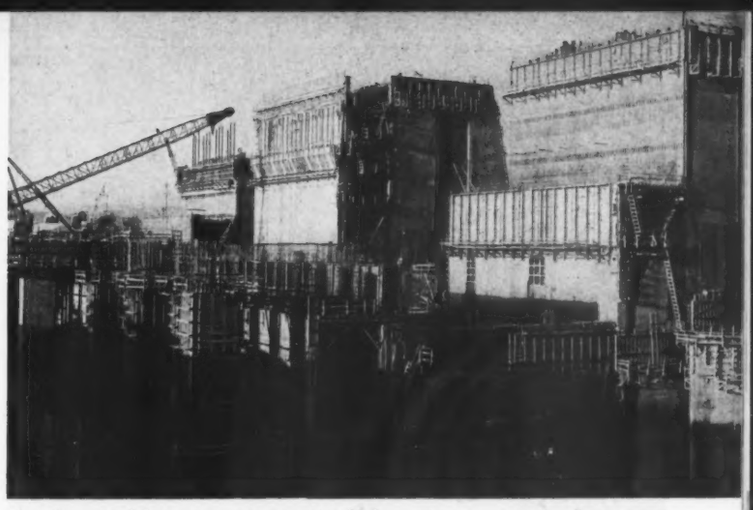
The second improvement discards traditional methods of alternate monolith construction in favor of a progressive in-line method of concrete placement. Under this arrangement, typical monoliths in each spillway block start from the south end and are repeated as forms move over toward the north end of the structure. Thus, the spillway is completed as it goes. With clever scheduling, the service bridge at the south end of the structure is virtually finished by the time the first low blocks are in on the north end. By breaking the schedule into four or five repeat jobs for the same crew, efficiency has been improved enormously. The Corps of Engineers design was sufficiently simplified so that these economies and mass production ideas could be put into effect.

The 1,370-foot spillway, with a crest elevation of 121 feet above sea level, was designed for a maximum discharge capacity of 2,290,000 cfs. The spillway crest is controllable by a series of radial tainter gates which span the 50-foot blocks between bridge piers. The massive spillway has no costly cheesecake, but it is entirely adequate. The contract calls for a uniform 5-day-week construction pace, and is expected to last from its starting date of October 29, 1952, through December 31 of this year. It includes 330,000 cubic yards of concrete and about 2,000,000 cubic yards of excavation in basalt rock. (See "Dam spillway yields to hard rock crews", C&E, April 1954, pg. 16.) Also included in the contract are the installation of tainter gates and the

(Continued on page 34)

This panoramic view of construction work on The Dalles Dam powerhouse shows work being carried on in successively advanced stages, beginning at right. Draft tube structures are being formed in the left half of the picture. Gantry cranes work from both sides of the huge installation.

The Fuller-Kinyon cement-handling system on this Johnson fully automatic batch plant is unloading cement from barges on The Dalles Dam project.



Blaw-Knox steel forms to support massive high concrete pours are in place at various levels on the powerhouse for The Dalles Dam.

Crews work around clock on The Dalles powerhouse

On the right shore of the Columbia River, just above The Dalles, Oreg., a battery of floodlights strung out for over a mile bears mute evidence night after night that time, the Columbia River, and the Pacific northwest power shortage wait for no man. Night and day the area is alive with activity—because the Pacific northwest desperately needs the first 14 generators of The Dalles Dam to meet ever-increasing power shortages.

The contract for the first phase of the powerhouse substructure, containing the base concrete for units 1 through 14, the station service bay, the fish turbine bay, and one of the non-overflow portions of the dam, is held by a joint-venture firm called The Dalles Powerhouse Constructors. Contractors in this combine include Donovan Construction Co., St. Paul, Minn.; C. F. Lytle Co., Sioux City, Iowa; S. Birch & Sons Construction Co., Great Falls, Mont.; Foley Bros., Inc., St. Paul; Winston Bros. Co., Minneapolis, Minn.; J. L. McLaughlin, Great Falls; F & S Contracting Co., Butte, Mont.; Johnson, Drake & Piper, Inc., Minneapolis; and Fegles Construction Co., Ltd., Minneapolis. Their $29,820,997 contract, covering work started July 11, 1953, and scheduled for completion December 1 of this year, contains a whopping $5,000-per-day penalty clause, applying to one stage, should the job be behind at that time. That explains the current rush as well as the many problems involving congestion in the work area, tough scheduling of pours, and high-speed form preparation to place 2,000 cubic yards of concrete per day.

Another phase of the powerhouse substructure calls for construction of bays 15 through 22, the excavation of the east fish ladder, and construction of the east concrete non-overflow dam. This job is proceeding at a less frantic pace on a 5-day-per-week basis because of its more liberal timing in the comprehensive dam-construction plan. Atkinson Ostrander Co., The Dalles, holds the $18,886,000 contract for this work. The job was started January 21, 1954, and is scheduled for April 15, 1956, completion. In essence, this job will provide an overflow section for the Columbia River while the closure section is being placed.

General design features will make The Dalles power plant second in size only to Grand Coulee as a hydroelectric installation.

Excavation

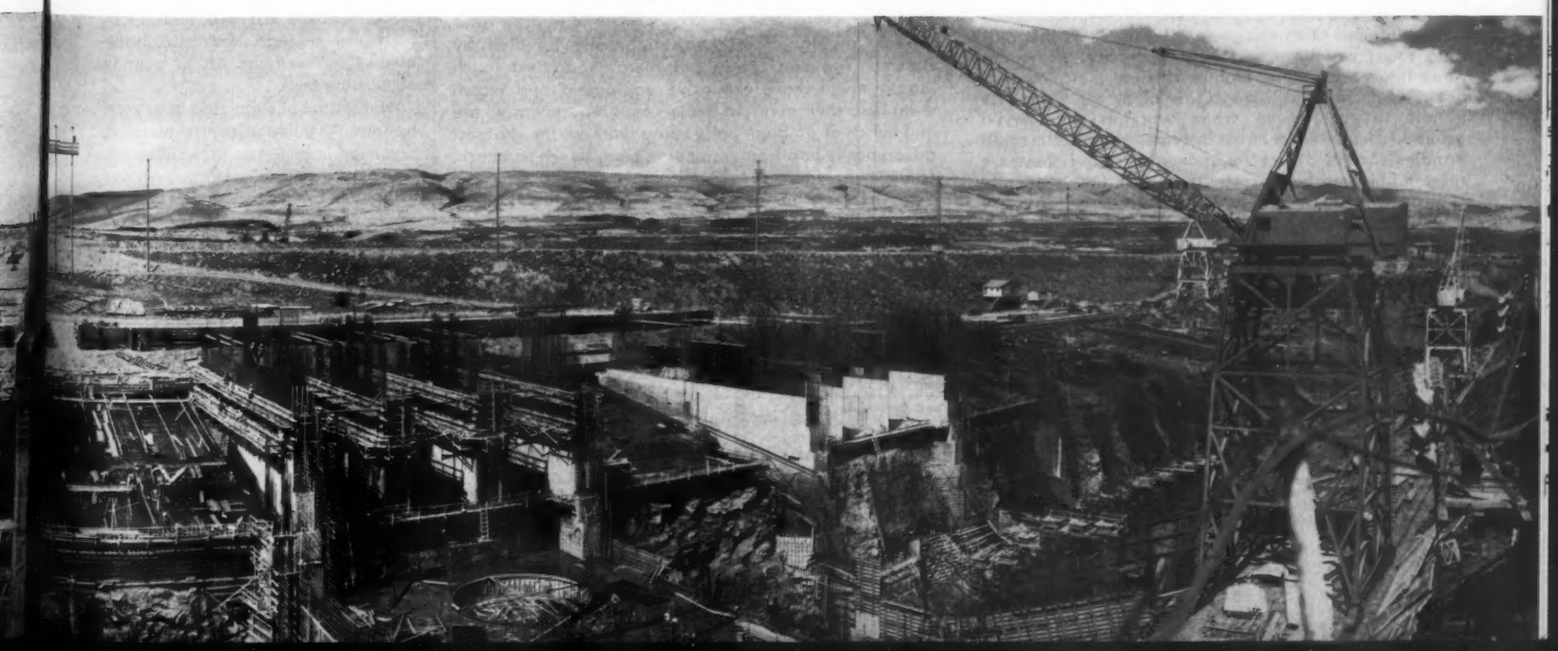
Excavation of the vast powerhouse prism, which carried the grade down to within a few feet of final elevation in blocky basalt rock, was done two years ago by a combine headed by S. A. Healy Co., Inc., White Plains, N. Y. When The Dalles Powerhouse Constructors took over, that firm continued the excavation, drilling, and explosives work to carry down to final project grade deep under the turbine floors. During this construction, the work site is protected by a cellular steel pile cofferdam, con-

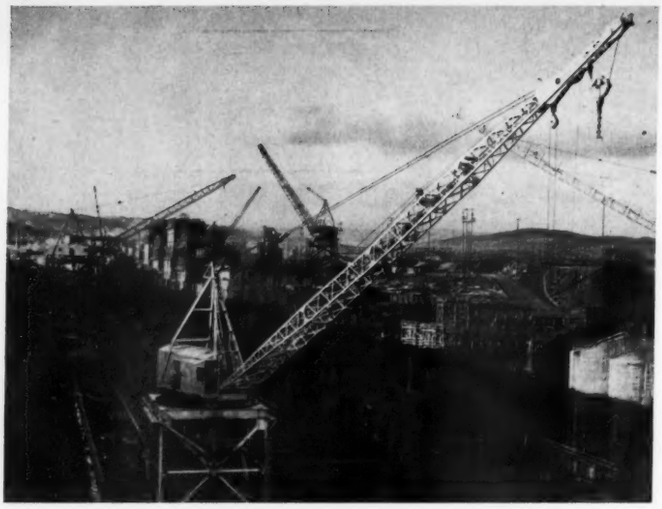
(Continued on next page)

Project Data for The Dalles Lock and Dam

RESERVOIR		
Drainage area in square miles		237,000
Storage in acre feet:		
Pondage (5-foot drawdown)	53,000	
Dead storage	264,000	
Total		317,000
Pool elevation* (feet above mean sea level):		
Maximum (at Big Eddy)		183.5
Minimum		155.0
DAM		
Maximum height of dam in feet:		
Spillway		125
Powerhouse		200
Earthfill		285
Length of dam in feet		8,500
Spillway design capacity (cfs)		2,290,000
NAVIGATION LOCK		
Height of lift** (normal) in feet		87.5
Clear plan dimensions in feet		86 x 675
Normal depth over the sill in feet		20
Minimum depth over sill in feet		15
POWER FACILITIES		
Main units:		
Size of units in kw		78,100
Number of units initially		14
Number of units in main control plan		16
Ultimate possible number of units		22
Auxiliary units:***		
Size of units in kw		15,000
Number of units installed		2
POWER INSTALLATION		
Total kw:		
Initial		1,122,000
Intermediate (main control plan)		1,278,000
Ultimate possible		1,746,000
FISH FACILITIES		
Fish ladders 2	Fish lock 1	

* Normal elevation is 160 feet
** Lock is single-lift type
*** To provide auxiliary water supply for fish facilities and power generation.





Washington gantry-mounted revolving cranes work from both sides of the powerhouse to place concrete as fast as possible.

(Continued from preceding page)

structed under the previous contract. In the fear that the work area might still be flooded by overtopping of this structure, The Dalles Powerhouse Constructors raised the cofferdam 5 feet in elevation. It was a wise investment. A sudden rise of the Columbia River early last year came within 2 feet of overtopping even that extension. Nevertheless, the cofferdam held.

Fast Operation

Of the two powerhouse substructure contracts, the one posing by far the biggest construction problems is that of The Dalles Powerhouse Constructors. Time is the biggest enemy. After May 1 of this year, a $2,000-per-day penalty will apply if the west assembly bay, fish turbine bay, west fish pickup, main unit bays No. 1 and 2, and the area west of the powerhouse are not complete. August 1 of this year is the scheduled completion date for main unit bays 3 to 6, with a $1,000-per-day penalty stipulation. November 1 is the date set for completion of bays 7 through 14 and the station service bay, with a $5,000-per-day penalty.

At the present time, The Dalles Powerhouse Constructors has the job scheduled for December 31 completion, including cleanup. Meeting that staggering schedule has posed enormous problems.

The very nature of the structure has made congestion in the work area a severe problem. Pour schedules have been a jig-saw operation, governed at one end of the scale by the necessity for getting 2,000 cubic yards of concrete per day, and tied at the other end by the time-completion element. The first concrete batching plant on the job, which had been purchased brand new for the project, collapsed of its own weight. The only man around the plant at the time escaped uninjured, however. And the big Johnson automatic plant brought in to replace the first setup—not a Johnson—gave a great potential by the addition of one mixer to help meet the schedule.

Another difficulty, of course, is the fact that this powerhouse concrete contains an average of 110 pounds of reinforcing steel per cubic yard of concrete. This makes both forming and concrete placing more difficult than on the average project.

The joint-venture contracting organization is using Blaw-Knox steel forms with 2-inch wood lagging on the face for about 50 per cent of the work. The remaining 50 per cent of the form area is being shaped by prefabbed wood panels of job design. A unique carpenter shop project was the construction of two wooden draft tube forms with about 16,000 contact square feet in each. These were built in four sections for re-use. Each of these forms will be re-used once so that four of the draft tubes will be built against wooden forms. The remaining ten are being built with a Blaw-Knox steel form also designed for repeated re-use. The wood forms consist generally of 3 × 6 studs, 2-inch sheeting, and structural steel wales. Both standard strength and Burke high-tension form rods are being used. The maximum lift of pour is about nine feet.

The setting of forms has been done by four Washington gantry-mounted revolving cranes, two of which work on either side of the powerhouse structure. Each of these machines is on an 85-foot gantry, carries 75 tons of counterweight, has a 165-foot boom, and can reach out 150 feet with the boom in flat position to handle the weight of the 4-cubic-yard concrete buckets. These gantry-mounted cranes are capable of picking up complete wall sections, often 60 feet long, at one time and moving them over to the next location. One of these cranes made a 64-ton lift in erecting one of its companion rigs.

Concrete Placing

The concrete operation is unique in that the mixed concrete is hauled

Eimco Tractor Excavator in open pit mine. Loading capacity in this rugged rock pile is at the rate of 1500-1800 tons per shift per machine.

Eimco Tractors with Eimco excavating attachments are proved rock loading machines. This 1½ cubic yard tractor excavator has a digging force of 36,000 pounds at the bucket lip. Any other type of rock loading equipment of this capacity able to exert this digging force would require an investment of two to three times that of the mobile efficient Eimco loader.

Eimcos load faster (at the rate of 3 to 5 yards per minute in rock) even when working on uneven ground. They are easier to operate — only two small handles control all tractor movements and they are more maneuverable because they have independently controlled tracks so that one track can be run forward while the other runs reverse.

The Eimco Tractor mounts its loading attachment directly to the tractor frame inside the track assembly. This is a unique feature exclusive with Eimco. Only Eimcos have been designed with the superior strength to permit mounting attachments on the frame so that they will work longer than conventional tractors, with less down time and a minimum of maintenance attention.

Yes! The tough jobs can be easily handled by Eimcos. You can safely put them in against much larger, much more expensive equipment and watch them hold their own. In the job pictured above, where one bench of an open pit is being worked, the greatest difference is apparent in moving from bench to bench. The Eimco required four minutes. The larger, more expensive equipment requird half a day with all hands pulled off their drilling, shooting and dozing jobs to help.

Investigate the Eimco Tractor and its loading attachment. It will show you new ways to cut costs — be low on the next job.

THE EIMCO CORPORATION

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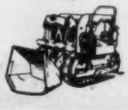


40-H

to the point of placement by Koehring Dumptors. A fleet of these machines was shop-modified to take out the sharp corners from the beds, and built up so that each unit would hold four cubic yards of concrete. Automatic end gates were installed in the units, which are cable-controlled and will open only when the load is dumped. Round Blaw-Knox concrete transfer buckets of 4-yard size were also shop-altered and given a square top so that the Dumptors could place the concrete direct in these units. The Blaw-Knox buckets also were equipped with an anti-splash baffle. On the north side of the powerhouse, a full-length dump ramp was built to permit the Dumptors to come in and discharge direct to the waiting buckets.

On the south side of the powerhouse, the Dumptors enter the work area on top of the cellular pile cofferdam, drive to the top of a steel ramp, and make their dumps to similar buckets which then are picked up by the two gantry-mounted Washington cranes and swung over to the pour.

For efficient consolidation of concrete, this job is using Chicago Pneumatic 417 and 418 compressed-air vibrators for about 90 per cent of the work. A few smaller Chicago Pneumatic 219 air vibrators and some Viber electric machines also are used.

Construction joints are being handled by two methods. On the horizontal joints, blasting by a water and air spray when the concrete is green exposes the aggregate from the previous lift. On vertical joints, some wet sandblasting is being done. The installation of rubber waterstops has been facilitated by an 8-inch hinged gate installed in the side of the Blaw-Knox forms—a job alteration. Concrete curing consists of a 14-day application of water and, where possible, some membrane-type cure.

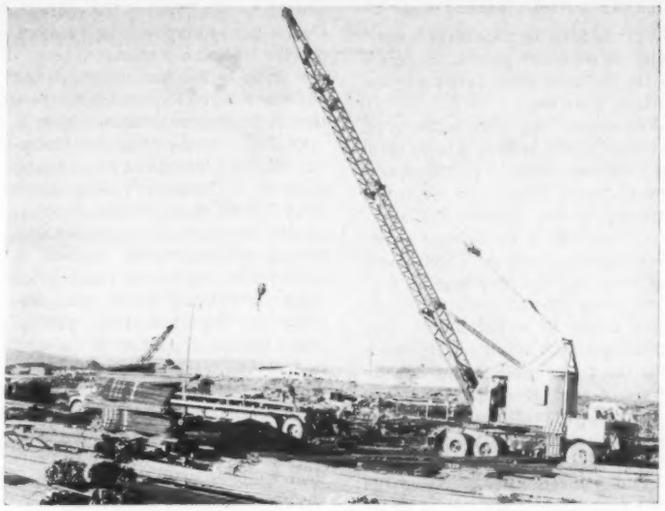
Production

Production of all concrete aggregates has been let by subcontract to Curtis Gravel Co., Spokane, Wash. This subcontractor has set up a pit and screening plant on the north bench area on the Washington side about 1½ miles below the dam. Curtis is digging the raw pit-run gravel with a Manitowoc 2-yard machine, equipped with an outsize 3-yard dipper, which loads a pair of Caterpillar DW15's.

In passing through the plant, the pit-run material goes through a 24 × 36 Universal jaw crusher and stacks in a 2,000-ton capacity surge pile, which is tapped by a Syntron feeder. This feeder takes the material to the three-deck Simplicity 4 × 12-foot scalping screen, at which point the necessary amount of blend sand is added to produce the finished product.

Throughs from the scalping screen pass to a tower at the top of the sizing plant, and oversize rock from the screen passes through a 4¼-foot Symons cone crusher set near the side of the screen. This crusher is in closed circuit with the screen and reduces everything to a size which will pass. There are two 4 × 12-foot two-deck Simplicity screens at the tower, along with two 5 × 10-foot Allis-Chalmers screens. Other plant components include an Eagle sand classifier, two 24-inch twin Eagle sand screws, and a 3-foot Symons cone crusher which is used when necessary to balance out

A Link-Belt Speeder crane loads reinforcing steel for the powerhouse to a flatbed truck.



aggregate sizes. The plant is geared for an hourly output of 350 cubic yards, which is stacked in four sizes: 3-inch minus, 1½-inch minus, ¾-inch minus, and sand.

Feeder tunnels under each of these stockpiles permit the material to pass to loading bunkers where three 28-yard hauling trailers, built by Curtis Gravel Co., carry the material to the Johnson batch plant. Two of these trailers are towed by Autocars with 200-hp Cummins diesel engines, and one of the trailers is pulled by a White 3000, also equipped with 200-hp Cummins power. If necessary, aggregate also is hauled by Caterpillar

(Continued on next page)

HERE'S ONE REASON YOU CAN MAKE MORE MONEY WITH MADSEN ASPHALT PLANTS

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MADSEN

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MODEL 440
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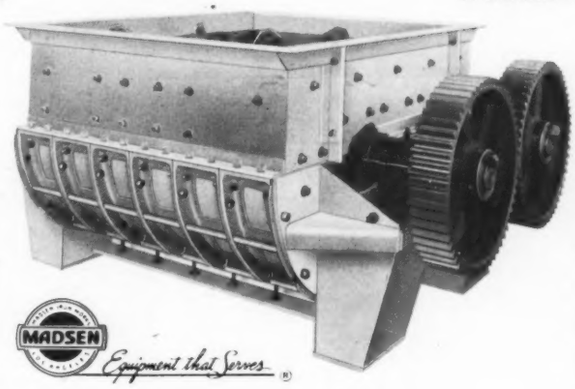
Available in 4000-lb., 5000-lb. and 6000-lb. capacities.



Probably the most important single unit in an asphalt paving plant is the pug mill mixer. Its mixing speed and dependability control the plant's production schedule — and this is a big factor in determining how profitable the operation will be.

Based on its performance in MADSEN Asphalt Plants (as well as other makes of asphalt mixing plants), the MADSEN Model 440 Twin-Shaft Pug Mill Mixer is considered the outstanding mixer in the industry. The superior performance of the MADSEN mixer is due to (1) pressure mixing through the paddle arrangement, (2) the contour of the mixer, (3) the patented shank design, and (4) the extra-large discharge gate. When you combine this mixer with the MADSEN Asphalt Pressure Injection System (Patented) you get an exceptionally fast charge-mix-discharge cycle with a discharge time of approximately 4 seconds regardless of batch size!

Yes, MADSEN gives you the money-making advantages in the individual plant units, that add up to a more profitable overall asphalt plant operation. That's why you're money-ahead when you buy MADSEN!

Features and Advantages

- Patented heavy cast steel mixer shanks for faster mixing with less wear and less power required.
- Externally removable edge-ground liner segments which eliminates need to remove shanks and tips to replace worn liners.
- Heavy-duty, cast steel cut tooth gears, with improved tooth angle for smoother operation.
- Heavy-duty interior combination thrust and seal collars, made of white iron and split for easy replacement.
- Mixer lower ends, upper ends, upper sides and center bridge forming the gate area are of fabricated steel, heavily welded throughout, built on accurately machined jig to insure uniform fitting of liners, shafts, bearings and gate rails.

FASTER MIXING
MORE THOROUGH MIXING
LOWER MAINTENANCE COSTS
LONGER LIFE

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MADSEN

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MADSEN IRON WORKS, INC.
Subsidiary of Baldwin-Lima-Hamilton Corporation
14100 EAST ROSECRANS AVENUE, P. O. BOX 38
LA MIRADA, CALIF., U. S. A.

(Continued from preceding page)

DW15's to keep up. This plant is handling the necessary input of aggregate to the Johnson plant in an average 12-hour work day.

Permanente and Oregon Portland Cement Co. bulk cement is being used, arriving from Portland by Tidewater-Shaver Barge Lines. The cement is unloaded to the Johnson full-automatic plant by a Fuller-Kinyon cement-handling system, which feeds the Johnson plant. Dry batched material from the Johnson automatic plant drops to a battery of four Koehring 4-yard tilting mixers which turn the fresh concrete out directly to the 4-yard Koehring Dumptors.

Despite the total collapse of the first batch plant, the job was down only 28 days so far as concrete production was concerned. Some of the units near the east end of the structure are months ahead of schedule because of the consistent 2,000-cubic-yard-per-day pouring schedule. The first two units, of course, are barely on schedule, but there is every indication that they will remain that way and will finish out on time. No provision for cooling concrete in summer has been necessary, with the exception of local aggregate sprinkling and the scheduling of concrete placing on the swing and the graveyard shifts.

Well scheduled construction operation of this sort exemplifies the finest kind of contractor ingenuity and planning.

Another Phase

Although Atkinson Ostrander's work is on a more deliberate 5-day-a-week basis, with more time allowed, it too is efficiently organized for excellent production. This job includes 26,000 cubic yards of concrete in the east fish ladder, 250,000 cubic yards in the powerhouse (the company has eight units here), and 77,000 cubic yards in the non-overflow section of this contract. As was the case with the previous job, S. A. Healy Co. did the rough excavation. Atkinson Ostrander followed along with a 260,000-cubic-yard rock-blasting job which carried the final grade down to elevation minus 24.

On the Atkinson Ostrander contract, the same basic raw pit aggregate supply is being used, with raw material being hauled from the pit direct to the power plant site where a crushing and screening plant is set up. Atkinson Ostrander also has the huge Dalles Dam spillway and navigation locks jobs, and the rock production plant also serves these operations. In addition to the contrast of hauling the raw material to the dam for processing, Atkinson Ostrander also is manufacturing considerably more of its sand than Curtis Gravel Co. is doing.

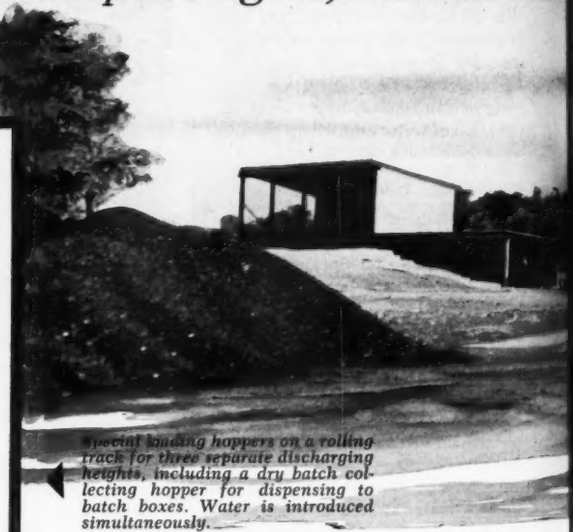
Forms on the Atkinson Ostrander job are similar to those used by The Dalles Powerhouse Constructors. About half are Blaw-Knox steel panels with wood lagging; the others are prefabbed wood forms built in the carpenter shop. Wooden forms are used on all water courses, and all wood forms are stiffened by steel strong-backs. High-tensile-strength tie rods are in use, with form setting similar to the other part of the powerhouse. Atkinson Ostrander uses a Colby 200 gantry-mounted crane on the non-overflow dam section, a Colby 240 on the east fish ladder, and two Clyde Whirleys on the spillway. On the eight-unit powerhouse section, a Colby 240 and a Washington revolving crane served the upstream end while a Washington gantry-mounted rig handles the downstream side work.

Concrete for the Atkinson Ostrander job is also mixed and proportioned through a Johnson full-automatic mixing plant, Koehring 4-yard tilting mixers, and Gar-Bro 4-yard concrete-placing buckets. Fresh concrete is hauled from the mixing plant on six converted Peterbilt trucks, each carrying two 4-yard concrete buckets. These buckets are raised to the pour by the various cranes, the concrete is dumped by air, and rented lightweight vibrators are being used for the consolidation of the material. Cutting work on horizontal and vertical joints is similar to that previously described, as is curing.

Furnishing, cutting, bending, and installation of the huge reinforcing steel job is being done by Steel Constructors of Portland, Oreg. This company is handling steel for both Atkinson Ostrander and The Dalles Powerhouse Constructors. In either case, the reinforcing steel is hoisted

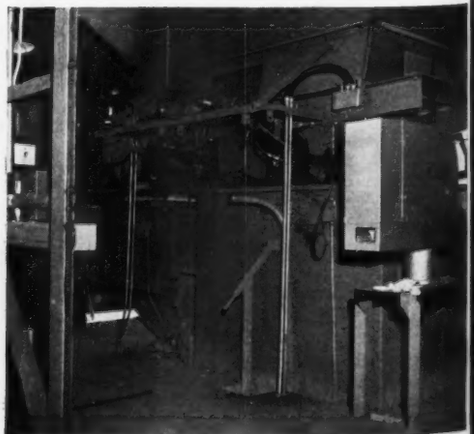
Why Batch Away YOUR

Midwest Supply Company finds New Heltze
Automatic Cement Plant with Batchmaster Batche
has perfect record in dispensing 40,000 barrels-



Special loading hoppers on a rolling track for three separate discharging heights, including a dry batch collecting hopper for dispensing to batch boxes. Water is introduced simultaneously.

A single operator controls entire operation of filling plant, measuring and dispensing. He can weigh all materials, including water and discharge 5½ yards of concrete in 30 seconds.



Compact Batchmaster Batchers for both aggregate and cement. Cement Batcher is sealed. Aggregate Batcher features air-operated clamshell gates. Sealed weighing apparatus has automatic recording device.

◀ Converted Peterbilt trucks haul two Gar-Bro 4-cubic-yard concrete buckets to the spillway job. At right, one of the revolving cranes prepares to lift a bucket of concrete off the truck bed.

to the point of pour by one of the gantry-mounted cranes.

Personnel

The construction program now in progress at The Dalles powerhouse, which will create a huge new electrical generating source close to the twin-load centers of Portland, Oreg., and Vancouver, Wash., is under the general supervision of the Portland district office of the Corps of Engineers. Col. J. U. Moorhead is district engineer, B. L. Peterson is chief of the engineering branch, and H. B. Elder is resident engineer.

For The Dalles Powerhouse Constructors, A. R. Bacon is project manager. He is assisted by John Heckart, general superintendent, and W. L. Davis, project engineer.

THE END

New Book on Statically Indeterminate Structures

The theory of statically indeterminate structures is treated in "Analysis of Statically Indeterminate Structures" published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. This, the first of two volumes, is devoted to basic theory and its application to the more common types of structures. The first half of the book is intended as an introduction to the subject; the remainder covers problems facing structural engineers.

Design office procedures are used in solving problems in continuous girders, frames, arches, secondary stresses, and suspension bridges. The book contains the important new method of moment distribution in which sidesway takes place automatically as joints are balanced in the normal rotation process. Individual chapters deal with deflections by the method of work and by special methods, slope deflection, and moment distribution. Also covered are the rigid frame, secondary stresses, the elastic arch, and suspension bridges.

The book was written by John I. Parcel, vice president of Sverdrup & Parcel, Inc., consulting engineering firm, and Robert B. B. Moorman, chairman of the department of civil engineering at Syracuse University. The 571-page book, profusely illustrated, may be ordered at $9.50 from the publisher.

ARBA Report on Industry And 10-Year Road Program

The report of the American Road Builders' Association "Task Force" on the ability and readiness of the engineering profession to carry out President Eisenhower's 10-year $101 billion highway program is now available in a booklet published by the ARBA.

Titled "The Highway Construction Industry in a Ten-Year National Highway Program," the report is based on thorough studies by authorities in the engineering, industrial, and governmental fields related to highway planning, designing, and construction. Besides introductory remarks and a resume of the group's findings, there are separate chapters on the nation's highway requirements, planning and design, materials and supplies, construction, and construction machinery and equipment.

The needs and preparedness for major construction of various states and regions are detailed in tables throughout the report. The availability of both equipment and manpower is also set forth in tables.

This transcript of the report presented at the annual ARBA meeting last January in New Orleans is priced at $1 a copy, and may be ordered from the American Road Builders' Association, World Center Bldg., Washington 6, D. C.

Booklet Treats Effect Of Frost on Highways

"Load-Carrying Capacity of Frost-Affected Roads" is the title of a new research report published by the Highway Research Board. Designated Bulletin 96, it is another of the reports delivered at the annual HRB meeting last January in Washington, D. C.

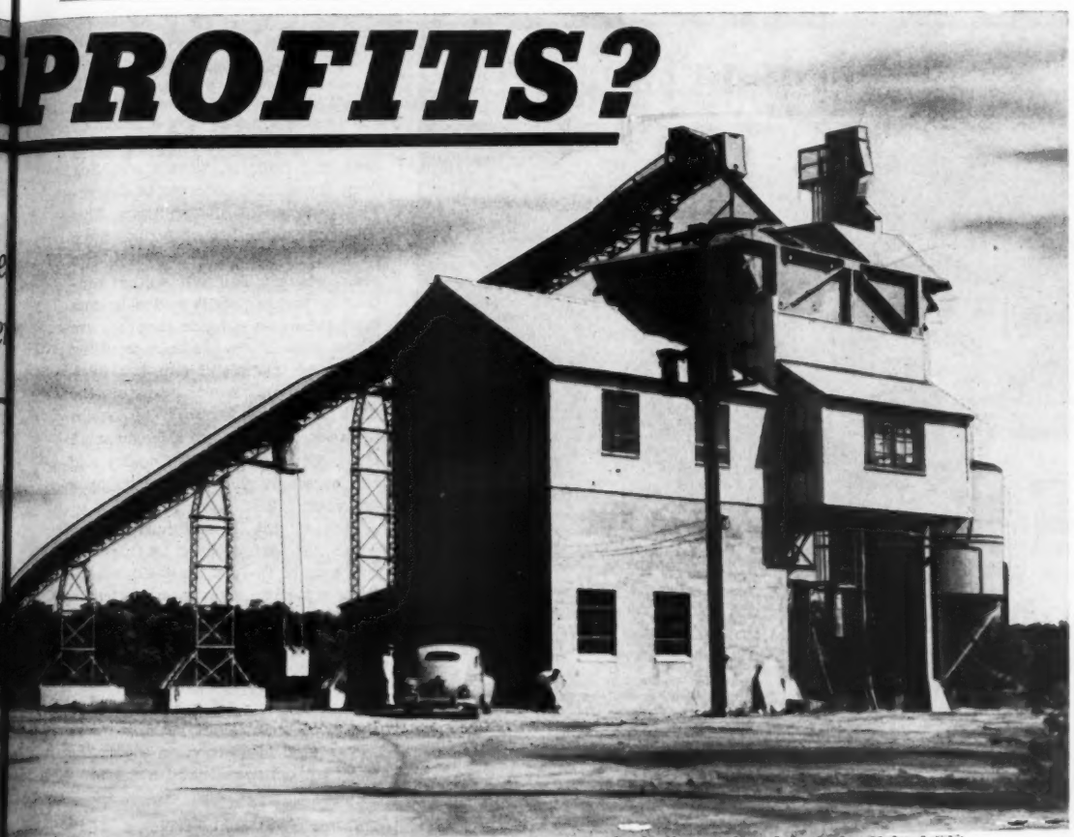
This report is the sixth covering a research project designed to determine the loss of strength that may occur in highways which are subjected to freezing and thawing action. The report shows a definite loss of carrying capacity as a result of these weather influences.

Bulletin 96, priced at 45 cents, may be obtained by writing the Highway Research Board, National Academy of Sciences Bldg., 2101 Constitution Ave., Washington 25, D. C.

Douglas Promoted by Joy

Joy Manufacturing Co., Pittsburgh, Pa., manufacturer of construction machinery, has appointed J. E. Douglas assistant district sales manager of the El Paso, Texas, territory.

...PROFITS?



Completely designed and built by Heltzel, this combination plant represents the most efficient concrete batching equipment available today.

Roadbuilder or blockmaker—transit or central mix if you use cement and/or aggregate batching plants you know the value of a fast, accurate operation. That's why this story may interest you—for it's another report of how Heltzel superior batching equipment saved the profits for another plant operator.

Boardman Supply Co., Youngstown, O., checked the record after batching some 44,000 bbls. of cement through their Heltzel Combination Plant. The record: a 15 bbl. plus—the result the average cement producers normally provide in their shipments. What makes this story even more amazing is the fact that Boardman was batching small amounts (600 lb. average) on a 5000 lb. scale.

As for speed, Boardman can weigh out *5½ yards of dry material, and the necessary water in 14 seconds—discharge it in 17 seconds.* As for handling savings, they can *put together all materials necessary for batching a yard of concrete for less than four and one-half cents.*

Heltzel designed and built the entire operation to give Boardman the most efficient set-up possible. It consists of four 65-ton aggregate storage bins at grade level. The bins are equipped with interlocked air-operated gates to prevent the mingling of materials. The bin discharges the aggregates onto a Heltzel Belt Feeder which carries them to a Heltzel Inclined Conveyer, which transports them to the top of the plant. Here they are distributed by a motorized turnhead into the proper compartment. Bin signals indicate aggregate level in the plant.

A cement hopper feeds into a Heltzel Screw Conveyer. A Heltzel Elevator carries the cement to the top of the plant where it is discharged either into the sealed cement compartment or into a recirculator. Cement is weighed and discharged through a sealed Heltzel Batchmaster. *All operations are automatically controlled from a single station that requires but one operator.*

This story can be duplicated whether your needs are for a single or multiple material plant, stationary or portable, for yard or highway use. Why not make sure you have the fastest, most accurate equipment possible. Don't chance losing time and profits with inferior equipment. *Specify Batchmaster Plants by Heltzel.*

HELTZEL
Batchmaster
BATCHING PLANTS

Heltzel — The Metal Steel Form and Iron Co. — Warren, Ohio

Flex-Plane — Road Joint Machine Co. — Warren, Ohio

14000 THOMAS ROAD

THE HELTZEL STEEL FORM & IRON CO., WARREN, O.

This aggregate-production plant, set up at the site of the dam project, takes raw pit-run material and turns out a finished concrete product for use on Atkinson Ostrander's contracts.

(*Continued from page 28*)

excavation of a spillway tailrace and approach channel.

Form Detailing

Professional engineers trained in stress calculations are doing the complex form detailing on this job, and the arrangement is working very satisfactorily. There have been minor modifications necessary to make some of the forms fit—particularly where reinforcing steel or the ease of stripping was concerned—but for the most part, the idea has already proved its merit. There are fewer men on the spillway contract than there are on many larger jobs.

The detailing crew, working under Chief Engineer Robert Kerr in Atkinson's office at 10 W. Orange Ave., South San Francisco, has standardized the procedure to a remarkable degree. The vertical faces, where construction joints occur, are being formed by Blaw-Knox steel form panels, while the upstream forms are Blaw-Knox cantilevered panels. The downstream forms, where supercritical hydraulic flows have to be considered, are being formed by a combination steel-face and wood-lagging type of panel. Steel-faced forms are being used on bridge piers. All forms generally provide for mass lifts of approximately five feet in height, with maximum lifts approximately nine feet high in some of the narrower pours.

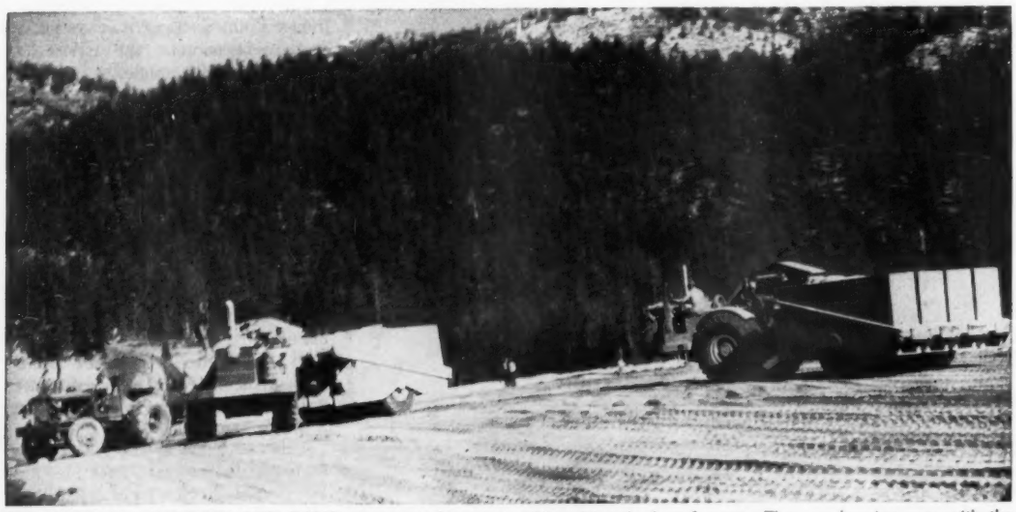
Gallery Forms

The detailing crew, in cooperation with engineers of Blaw-Knox Co., took a page out of the tunnel-lining book and came up with a traveling form for placing concrete in the access galleries of the spillway. This steel form is built exactly like those used in tunnel-lining work—in two basic sections. The first section consists of the two walls and a bottom fillet. When set in place, it covers two 5-foot lifts. There is also a traveling roof form, complete with top fillet. It has screw jacks for adjusting the fillet wings and the over-all height of the form. This form rides on small but powerful rubber-tire dollies and can be set in place in 2 hours by a few men.

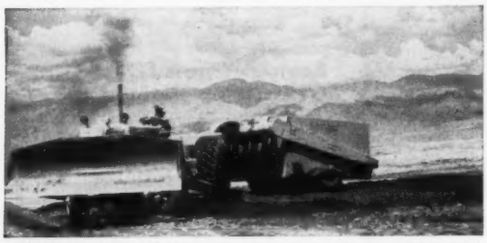
Perhaps the most unusual item which has been detailed by this crew is a pair of 50-foot Blaw-Knox continuous steel pan forms, supported on 36-inch 360-pound-per-foot steel I-beams, which carry one entire service bridge pour across the pier tops without the usual expense of intricate and costly falsework. To carry this wide span, eight bearing plates are grouted in position on top of the two piers concerned, and eight bear-

One of two gantry-mounted Clyde Whirley cranes used to position forms and handle concrete on the spillway project. The scaffold tower at left encloses a stairway used by workers doing handwork at the bridge deck level.

COMPACTING EARTH FILLS



ON HIGHWAYS, AIRPORTS AND DAMS, new records are being set every day by Southwest Compaction Rollers. Here two 75-ton rollers and Cat DW21 tractors are compacting 6" to 12" lifts with only 4 to 6 passes. They are keeping pace with the largest earth-moving equipment working on 24-hour job schedules in the High Sierras.



ONE YEAR AHEAD of schedule! This record on a large earth fill dam is partially due to the improved high speed of compaction by Southwest Rollers which are used exclusively on this job.

SPEED PAYS OFF! A fleet of four 50-ton Southwest Rollers, with Cat and Le Tourneau tractors, use their weight, their kneading action of tires and extra oscillating freedom to permit faster traveling.

ADAPTORS FOR TRACTORS, most models or types, are available at Southwest. On highway and housing projects, small 20-ton Compaction Rollers can be towed by motor graders or other power equipment.

VERSATILE! Any standard 4-section Compaction Roller can be converted in a 3-, 5-, or 6-section roller. Parts for conversion are available as a complete package.

CONSTRUCTION MACHINERY DIVISION
Southwest Welding & Manufacturing Co.
ALHAMBRA, CALIFORNIA

The method of progressive construction employed on The Dalles Dam spillway is illustrated in this picture. At the left, the structure is barely started, while at the right, pier work is nearing completion.

ing points are provided by the steel H-beams, four on either side. One of these forms, fully assembled, weighs 46 tons. It has been handled in one lift by one of the two Clyde gantry-mounted cranes serving the spillway section. The forms, once filled, are stripped after 10 days by dropping them down with four 20-ton capacity hand crabs, one winch at each corner. The form is then picked up from the spillway ogee and moved to the next position by one of the Clyde Whirleys.

There is a central job carpenter shop which was set up principally for necessary alterations to the shipped-in forms, as well as for the preparation of odd-shaped and miscellaneous pours using forms which still must be detailed to some extent in the field. Even so, at least 90 per cent of the work of this carpenter shop, even on wood forms built in the field, has its detailing originated in the South San Francisco office. Even the design and purchase of form hardware, such as high-tensile form bolts, is arranged by the detailing office.

One of the most workable parts of the idea has been its tendency to make experts out of the field form erectors. Any given spillway block, reaching from basalt bedrock to the top of the service bridge, represents many pours. This total number of pours has been broken down into four or five separate jobs. A small form crew specializes in the erection of form panels for the mass concrete at the bottom of the spillway section. A second small group of specialists then takes over from that break-off point to approximately the top of the spillway ogee. A third group carries it onto the bridge deck. A fourth group specializes in construction of the 50-foot deck spans. It all makes for a well timed, efficient, and low-cost operation.

Two Clyde gantry-mounted Whirley cranes riding on a track at the upstream edge of the spillway are used for handling all the forms accessible from that point. The baffle piers and stilling basin section of the spillway were built with the help of one of these machines, which at that time traveled on a track downstream from the spillway. That section was finished before construction of the spillway proper began.

There has been a considerable amount of handwork necessary in connection with bolt-hole patching, cleaning of gate guides, and other such operations which require men to work high off the ground. Access to these points is being provided by a series of Beatty Safway steel scaffolds, which can be picked up whole sections at a time by one of the traveling cranes. Permanent boxed-in towers with well-built stairsteps lead up to the first completed bridge deck. These scaffolds have paid off handsomely in safety as well as in improved carpenter efficiency, since workmen have to walk up or down with tool boxes in their hands.

Concrete Setup

The combination of centralized form detailing and progressive concrete-placing methods has made it possible to hit production figures as high as 10,000 cubic yards per week.

The concrete production setup for the spillway is the same arrangement which also serves Atkinson Ostrander's powerhouse contract, and which later on in all likelihood will serve the concrete portion of the navigation lock. At the present time, a considerable portion of these facilities is earmarked for use in spillway construction.

Raw aggregate for the concrete comes from a government-furnished gravel pit on the Washington side of the river below the dam. This material is being loaded at that point by a Bucyrus-Erie 54-B shovel, which serves a fleet of five Peterbilt trucks

(Concluded on next page)

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DIVISIONS

EASTERN CONCRETE PILE CO.
80 Boylston St., Boston, Mass.

AMERICAN DRILLING COMPANY
92 Water St., E. Providence, R. I.

(Continued from preceding page)

hauling Southwest 25-cubic-yard wagons. These bottom-dump units bring the material to the spillway site to be processed.

In its route through the plant, the material passes over a grizzly screen which separates all rocks smaller than 18 inches in size. Boulders larger than 18 inches are rejected. Oversize rock from 6 to 18 inches in size is routed through a 24×40-inch jaw crusher, arranged in closed circuit with the main stacker conveyor. This arrangement feeds a large surge pile tapped by uniform feeder gates which feed the screening plant. The sizes of aggregate manufactured include 6-inch minus, 3-inch minus, 1½-inch minus, and ¾-inch minus.

One of the features of this rock plant is the manufacture of virtually all required sand. There are two Marcy rod mills in the line for sand grinding, arranged in closed circuit to the sand screening deck. Sand manufacturing facilities also include two Wemco classifiers, two Dorrco sizers, and a set of dewatering screws. Actually, the sand facilities embrace equipment both for manufacturing and sizing.

The company obtains its feed for the rod mill by using oversize material from the other bins. There are two Symons shorthead cone crushers in the line, as well as two Symons standard cone crushers, to begin the breakdown process ahead of the rock mill.

The feed-out arrangement from this plant consists of a main tunnel system, fed by variable flow feeder gates which train the material as necessary to the bins of a Johnson full-automatic concrete batching plant. This plant has been set up near the spillway site, only a short distance from the aggregate plant. The batch plant is convenient to all parts of the job, including the powerhouse and navigation lock.

From April through October, Type IV cement, received from the Permanente Cement Co., Oakland, Calif., and Oregon Portland Cement Co., Portland, is used on the spillway, with Type II Permanente cement being used in bulk the remainder of the year. This material is handled at the Columbia River by Tidewater-Shaver Barge Lines, and is pumped to the 18,000-barrel cement storage facilities of the Johnson plant by a Fuller-Kinyon cement-handling system 400 feet long.

Batching

At the Johnson plant this bulk cement is mixed scientifically with various sizes of aggregate, according to the Corps of Engineers mix formula. The dry-batched concrete falls directly into four 4-yard Koehring tilting mixers which are mounted on a platform slightly below the weigh scales. These mixers, after turning out fresh concrete, dump the material to a 16-cubic-yard wet-batch hopper, which in turn loads 4-yard Gar-Bro buckets on trains going out to the spillway. Carloads of loaded concrete buckets are pulled to the spillway by several diesel-powered General Electric locomotives which spot the material within easy range of the gantry-mounted Whirleys. These machines handle the material from the upper side of the spillway.

Concrete for the Phase III (powerhouse and east fish ladder) contract is hauled in flat-bed trucks. This method will also be used in transporting concrete to the navigation locks.

All concrete is being placed in flat 20-inch lifts regardless of the size of the pour. In the case of mass spillway pours, these layers are stairstepped to the best possible advantage for quality of concrete as well as speed.

The flat joints between pours are being cleaned prior to placing the next lift of concrete by a blast of air and water applied while the concrete is still green. This removes all excess laitance and leaves the surface of the previous concrete aggregate exposed. There has also been some hydra-silica cleaning of vertical joints. All concrete curing consists of a steady application of a water spray for ten days with Columbia River water supplied by pump to the point of pour. By means of this well timed schedule, as well as the innovations in form layout and scheduling, Atkinson Ostrander has brought The Dalles Dam spillway job several months ahead of schedule.

Personnel

Design and supervision of The Dalles Dam is under the general direction of the Portland District Office of the U. S. Army Corps of Engineers, with Col. J. U. Moorhead as district engineer. H. B. Elder is resident engineer.

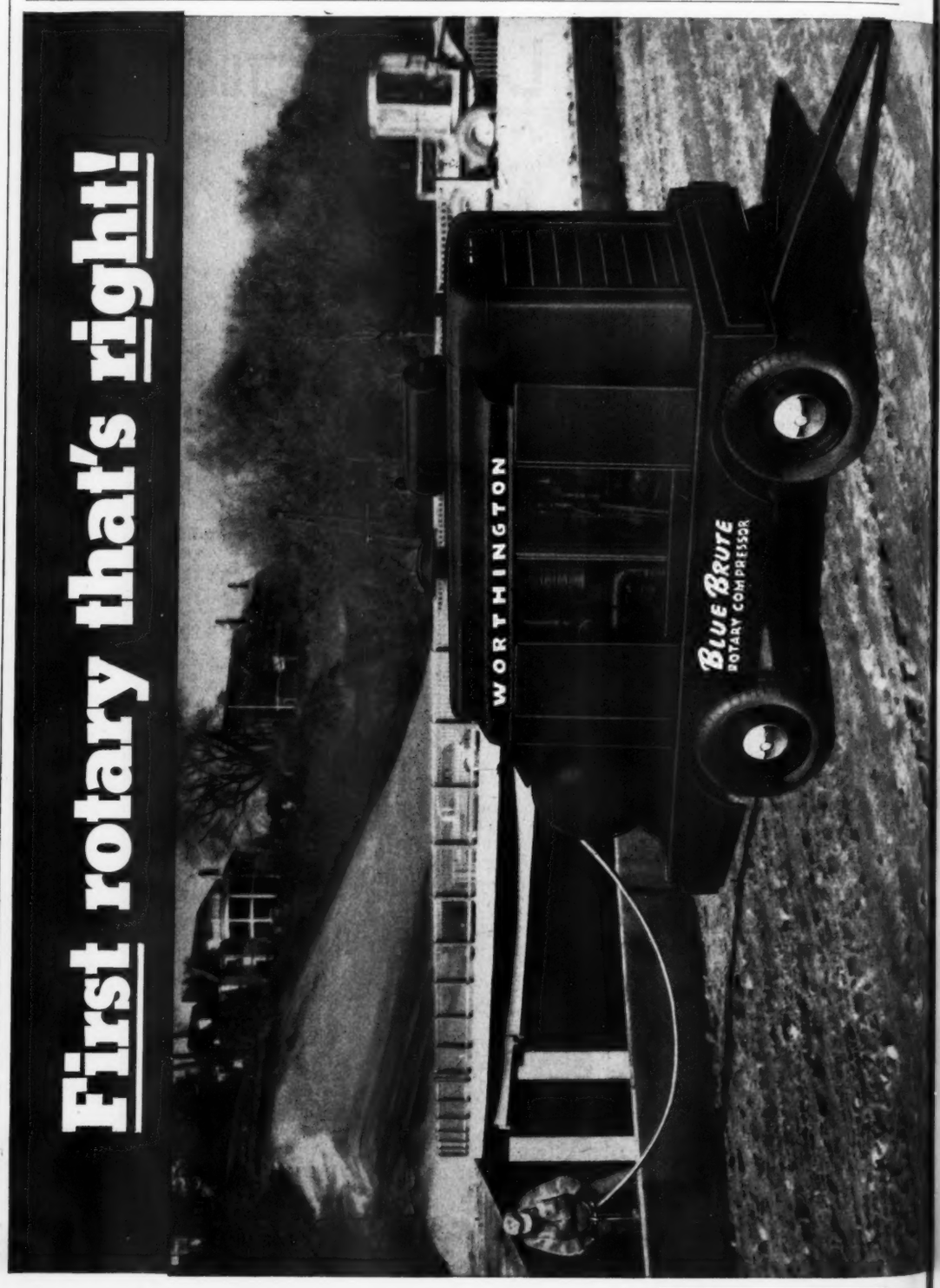
Atkinson Ostrander Co.'s field work is under the supervision of project manager John Morton, assisted by Guy Heimsoth. Joe McNabb is project engineer, Vernon Bradley is general superintendent, and Joe Davis is shift walker in charge of the spillway work.

THE END

Support for Better Roads Is Urged by New Film

The need for public support of the better roads program is emphasized in "Ten Days per Man", a 16-mm color-sound film produced by the Euclid Division of General Motors Corp.

The movie, which derives its title from the pioneer era when every man was required to give ten days' labor on road construction, encourages public and individual support of legislation for better roads throughout the country. Designed for showings before civic and service groups, governmental agencies, highway officials, and schools and universities, the 26-minute film may be obtained by writing the Sales Promotion Department, Euclid Division, General Motors Corp., Cleveland 17, Ohio.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BLUE BRUTE
ROTARY COMPRESSOR
NEW COMPRESSOR STAR! Besides its three big features, the new Blue Brute boasts a two-stage oil separator, low-set fuel tank, separate air and oil tanks, and shorter wheel base. It all adds up to the sturdiest, easiest-to-use, most practical rotary yet.
. . . and our torture tests say so

New Wheel Tractor Is Most Powerful in Line

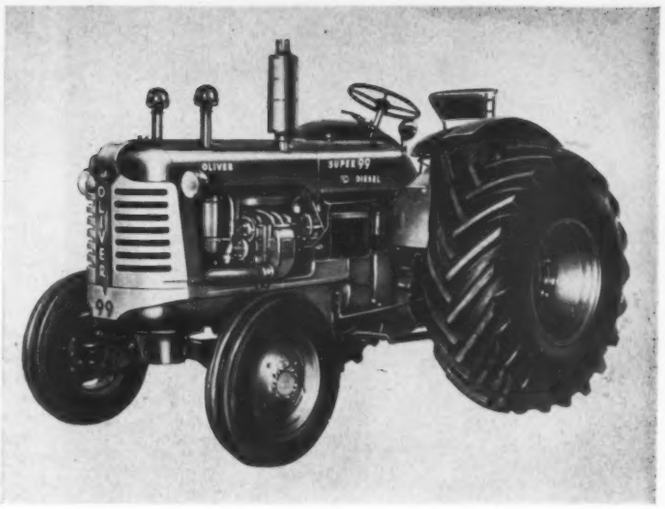
■ The Oliver Corp. has announced the most powerful industrial wheel tractor it has produced to date. The Super 99 GM diesel tractor develops 72 horsepower on the drawbar and 80 horsepower on the belt.

The new tractor has been equipped with a two-cycle General Motors diesel engine, offered for the first time in a factory-built wheel tractor. The power unit is a full diesel engine that starts quickly on diesel fuel alone. No auxiliary engine or special fuel is needed.

The two-cycle principle provides an exceptionally smooth flow of power, the manufacturer points out, since each down stroke of every piston is a power stroke.

Other advancements in the Oliver Super 99 GM diesel include a six-forward - speed transmission, flat roomy operator's platform, rubber spring seat, double-disk differential brakes, and a recirculating ball-type steering gear. Special units include an independently-controlled power takeoff and a three-way hydraulic system.

For further information write to The Oliver Corp., 400 W. Madison St., Chicago 6, Ill., or use the Request Card at page 18. Circle No. 626.



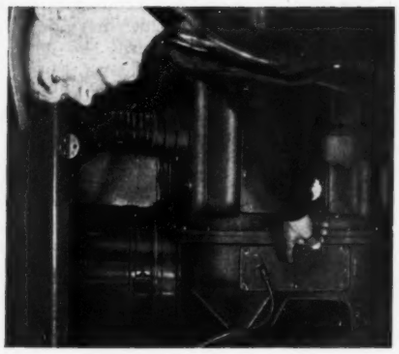
The Oliver Super 99 GM diesel tractor develops 72 drawbar horsepower.

. . . and our torture tests say so

Every feature in the new Worthington Blue Brute Rotary has been proved and re-proved by many months of the most grueling tests we could dream up. Actually, that test period represents a span longer than the service life of the average compressor.

This powerful new rotary is ready now with *all* the features you want. Look below for three of the most important ones.

QUICK, EASY INSPECTION. For example, an unskilled mechanic can replace a rotor blade in a jiffy — right in the field! Photos tell story of speedy blade removal. (1) Take out machine bolts and remove bearing cap . . . with needle bearing in place. (2) End plate is removed without disturbing inner-bearing race on rotor shaft. (3) Rotor blade removed for inspection or replacement. That's all there is to it!



EASY-ACTING RELIABLE CLUTCH lets you warm up the engine *before* you cut in the compressor. Result: less wear and tear, quick starts *all* the time. Symmetrical clutch also assures vibrationless operation at all speeds and acts as safety connection between engine and compressor in case of serious malfunction of either.

FULLY SELF-DRAINING COMPRESSOR eliminates settling of oil and water in cylinders, inter-stage chamber or discharge. The Blue Brute's unique cylinder arrangement gravity-drains *all* oil and moisture during shutdowns. Never any gummy accumulation to damage blades on cold starts.

NEW COMPRESSOR START Besides its three big features, the new Blue Brute boasts a two-stage oil separator, low-set fuel tank, separate air and oil tanks, and shorter wheel base. It all adds up to the sturdiest, easiest-to-use, most practical rotary yet.

If you haven't seen the new Blue Brute Rotary yet — see it now at your Worthington distributor's. Or write for Bulletin to Worthington Corporation, Section H.4.18, Harrison, N.J.

WORTHINGTON

IF IT'S A CONSTRUCTION JOB, IT'S A *BLUE BRUTE* JOB

ROCK DRILLS • WAGON DRILLS • PAVERS • CONCRETE MIXERS • PORTABLE PUMPS

Dovetail Anchor Slot Seals Out Concrete

■ An improved dovetail anchor slot sealed so that concrete cannot enter the open face has been developed by Gateway Engineering Co., 3233 W. Grand Av., Chicago 51, Ill. Filled and sealed in the manufacturing process, the dovetail slot is marketed ready for use.

A chemically-treated Kraft fiber facing is crimped over the open face to make a tight seal, and a built-in treated Kraft filler material keeps concrete from entering through the end of the dovetail. The Kraft filler is reported to have better resistance to deterioration from wetting than material used in the past.

The dovetail anchor slot is used for making dovetail grooves on concrete surfaces to receive anchors for masonry surfacing. Anchors are inserted by breaking the Kraft seal and twisting them into place. With concrete sealed out, the usual cleaning out of the groove is eliminated.

The Beehive dovetail anchor slot is made of galvanized sheet steel, and the anchors are made of galvanized stock.

For further information write to the company, or use the Request Card at page 18. Circle No. 683.

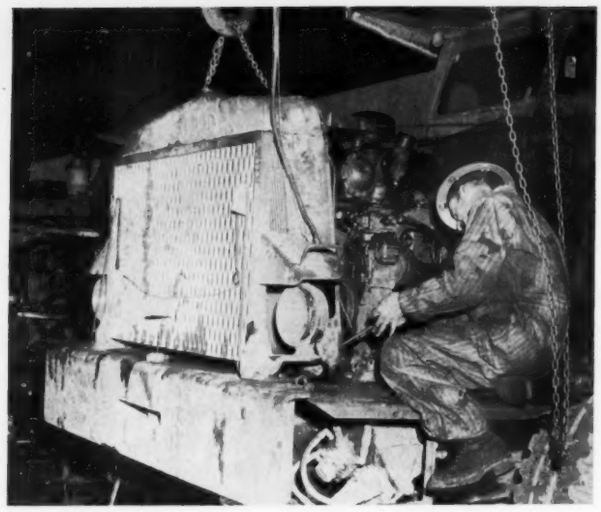
Builder and Supplier Of Cranes and Derricks

■ Heavy hoisting, rigging, and lifting equipment designed and manufactured by Downs Crane & Hoist Co., 540 W. Vernon Ave., Los Angeles 37, Calif., is discussed in a new folder available upon request.

The concern builds complete cranes and derricks and supplies them ready for operation, or will supply parts and fittings from which the contractor may assemble his own equipment using his own design and structural material. The design, shop drawings, and a bill of material for cranes and derricks of any specific dimensions and capacities may also be obtained.

The folder illustrates some of the large number of items that are in regular demand and which the company carries in stock for immediate shipment.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 698.



Inside the repair shop, a Euclid truck gets a fast radiator overhaul. Each bay has plenty of hoisting gear handy to facilitate heavy lifting. In addition, the shop contains welding, steam-cleaning, and paint sections, as well as other repair facilities.

Ray Day Photos

Routine inspections keep The Dalles spreads working

One of the busiest heavy-equipment maintenance men in the United States is at work in a little office deep in a maintenance shop at The Dalles Dam in Oregon. From this tiny cubicle, he directs the upkeep and repair of a $3 million fleet of equipment, of which over $2 million worth is rolling stock. That responsibility, coupled with the contractor's basic policy of first-rate equipment maintenance, is enough to make this supervisor's chair a kind of maintenance hot seat.

Directing these operations is Chuck Throckmorton, master mechanic for the joint-venture firm of Atkinson Ostrander Co., contractor on The Dalles Dam spillway, navigation lock, and a sizable portion of the powerhouse. Throckmorton's normally big job is made bigger still by the wide variety of equipment such different types of construction require. At one end of the scale, for example, he maintains and repairs machinery in a raw-gravel pit, a major crushing-screening plant, and a huge automatic batching plant, not to mention smaller equipment like concrete vibrators and night-lighting systems—all of which enters into the concrete construction of the spillway. At the other end of the scale are large gantry-mounted shipyard cranes, with their extremely heavy rigging and maintenance problems. In between, for variety, there is the maintenance of machines with a total of approximately 16,000 cubic feet of compressed-air capacity, an enormous amount of drilling machinery, drill steel and bits, and such rolling items as Euclid and Peterbilt trucks.

Faced with this staggering maintenance job, Chuck Throckmorton nonetheless appears unperturbed and very much at ease. Asked to explain his complacence, Throckmorton will pinpoint the basic secret of his unquestioned efficiency. Instead of pointing to complex and secret processes, unheard-of tools, or an enormous mechanical force, Throckmorton's explanation is an unbelievably simple one.

"The only tools I use," he explains, "are a scratch pad, a pencil, and my eyes. If I don't make regular inspections and record what I find, the machines won't last long and neither will I."

Basic Policy

For more than two decades the equipment-maintenance policy of the Atkinson Ostrander joint-venture sponsor has been largely preventive. Guy F. Atkinson Co., South San Francisco, Calif., neither babies nor gold-plates its equipment, but neither does it tolerate the kind of operation which is unnecessarily abusive. To find this happy meeting ground, the company has made equipment main-

This special bucket has vertical bars welded in place to prevent "skulls," large slag deposits which build up in ladles, from clogging the bucket. Note the use of Stoody 21 on the bars and the inside of the bucket. Monthly reapplications of hard-facing keep it in shape.

GETTING BETTER SERVICE FROM ALL TYPES OF BUCKETS

Down in Birmingham, Alabama, there is a company that really knows all about buckets—the Birmingham Slag Company. This organization is chiefly concerned with the reclamation of blast furnace slag which is crushed and treated for the production of an aggregate used primarily for road building. There are few materials more abrasive than this slag; ordinary buckets just can't take it without the protection afforded by extremely wear resistant hard-facing. This is true of all types of buckets used by Birmingham Slag Company . . . *special shovel buckets handling the "skulls," clam shells and scoop lifts.*

The pictures here pretty well tell the story. The company uses Stoody 21 liberally as shown in the illustrations to protect teeth, lips, sides and runners. As wear occurs, reapplications of Stoody 21 are made, as necessary, to keep the equipment in top operating condition.

Get complete details on the use of Stoody 21 and other Stoody alloys; you'll find them in the Stoody Guidebook, available from your dealer (consult the yellow pages of your telephone book)—or write to the company.

This latch plate also gets a Stoody 21 treatment to prevent wear.

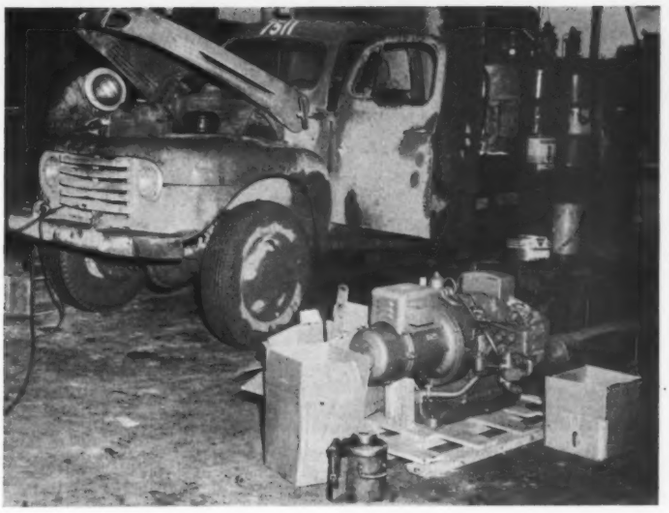
These Stoody 21 beads across the bucket here resist severe abrasion as it is dragged across the rubble in the slag pit.

The lips on this clam shell are kept in good shape with beads of Stoody 21 for a tight seal.

The scoop lifts handling crushed aggregate lead a rough life; Stoody 21 keeps the lips, sides and bottom in condition. Occasional beads of this material are added as wear occurs.

STOODY COMPANY 11936 East Slauson Avenue, Whittier, California

Keeping $3 million worth of heavy equipment in service is a vital function on The Dalles hydroelectric project



Even the lube truck needs occasional attention from Atkinson Ostrander's mechanics. In the foreground is an Onan diesel electric generating set ready for emergency installation should a rig break down. Spares for vital operations are always on hand.

tenance an important part of the teamwork which goes into the making of such large structures as The Dalles Dam spillway, powerhouse, and navigation lock.

Atkinson's policy really begins with the selection of its equipment. Knowing that it's good business to standardize where possible, the company habitually uses equipment which over the years has demonstrated an ability to get the job done at good speed and reasonable cost, with a minimum of maintenance. The last factor is especially important, the company feels. Should any piece of equipment begin to require costly maintenance as time goes on, similar units of this equipment on other jobs are studied and compared. If a certain brand of light plant, for example, starts to show excessive and mounting maintenance costs over a period of time, every master mechanic and general superintendent in the Atkinson organization quickly passes the word to headquarters and the purchase of that equipment is discontinued.

As a result, this contractor has fairly well standardized on the makes of equipment which have served the company well through the years. While the Atkinson organization never indorses a product officially, it long has been a consistent Caterpillar and Bucyrus-Erie customer, and a repeat-order firm for such outfits as Euclid, Peterbilt, and Gardner-Denver. In the very act of selecting equipment, the company demonstrates its wish to avoid breakdown time wherever it can.

Although Atkinson's offices are scattered from Long Beach, Calif., north through Portland and Seattle, all equipment is considered on a pool basis. When four 50-ton-capacity hand crabs were needed at The Dalles, for example, they were available only at the Long Beach yard. They were quickly shipped up. The pool-type equipment policy also tends to standardize maintenance procedures. To standardize further, Atkinson employs traveling mechanics who check the various jobs periodically. And nobody, of course, is more conscious of equipment maintenance than the

(Continued on next page)

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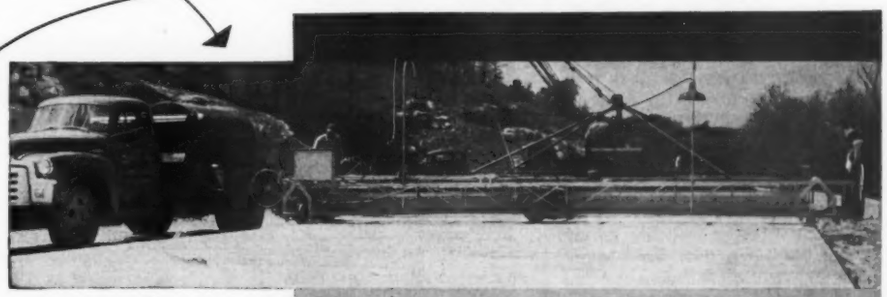

In cooperative effort with William F. Middlestadt of Seals, Inc., of Baltimore, who furnished equipment and personnel, CARDINAL NON-BRAK BLADES cut a 68 mile x 1½ inch longitudinal joint in this new two lane highway, and a 24 foot transverse joint every 18 feet . . . total—1,000,000 lineal feet through limestone aggregate. Job completed with CARDINAL NON-BRAK BLADES in record time at a record low cost.

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Lowest initial cost on the market—reinforced with steel and fiberglas for better cut and longer life.

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When you work with CARDINAL, you work with blade men who know the concrete cutting business . . . men who will frankly tell you when a rugged, low-cost CARDINAL NON-BRAK BLADE will do the job on green concrete, at less cost than a diamond blade . . . or, when a CARDINAL DIAMOND BLADE will give you the best deal, cost-wise, on aged concrete or other hard specifications. More footage per day . . . less cost per cut—that's the kind of guarantee that makes good sense. Call, write or wire, today!

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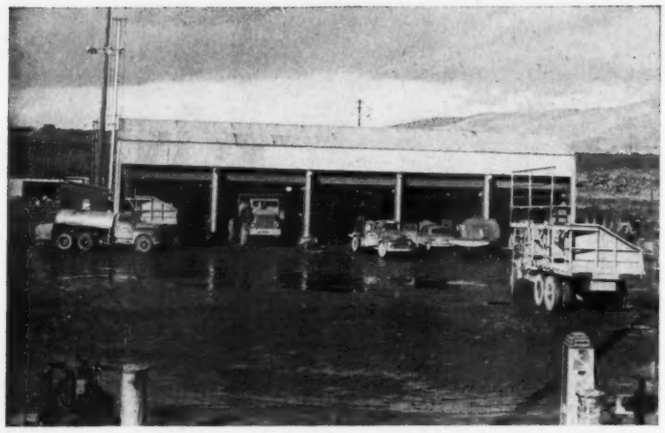


Five heavy-equipment bays in this Atkinson Ostrander Co. shop at The Dalles Dam site permit simultaneous repair work on a number of rigs if the need arises. The company's preventive maintenance program helps avoid a full shop, however.

(Continued from preceding page)

project managers, general superintendents, and project engineers on Atkinson's payroll. They know only too well that production schedules can be met only if machines are maintained so they continue to perform somewhere near peak capacity.

One of the company's traveling mechanics explains it this way: "When you set out to do a piece of work with one of these machines, you know—or you should know—that a certain amount of steel is going to wear off as you get that work done. The wear may be in gears, in pistons, or moving parts—or on the teeth and lips on the bucket of a $15,000 shovel. A man's got to expect parts to fail and metal to wear down. That's only being realistic.

"It's also pretty realistic, in my opinion, to catch that wear before something drastic happens to the machine. When you get to where you can spot that in advance and fix it before the machine breaks down, you're a master mechanic. Until then, you're not!"

It is for precisely this reason that Chuck Throckmorton considers his inspection, his pencil, and his scratch pad of work forms the most important tools of his trade. Untold hundreds—perhaps even thousands—of downtime hours have been prevented in Atkinson Ostrander's operations for the simple reason that Throckmorton, with the help of his submechanics and the operators themselves, has averted trouble. Many a repair job has been scheduled on a graveyard shift, when the machines were idle, after inspections the day before showed that something was about to break down. Although evidence of this policy can be seen on practically any Atkinson job, the thing which makes The Dalles Dam such an interesting example is the variety and size of the work. All told, the company has about $35 million worth of work underway in the three contracts.

Equipment Fleet

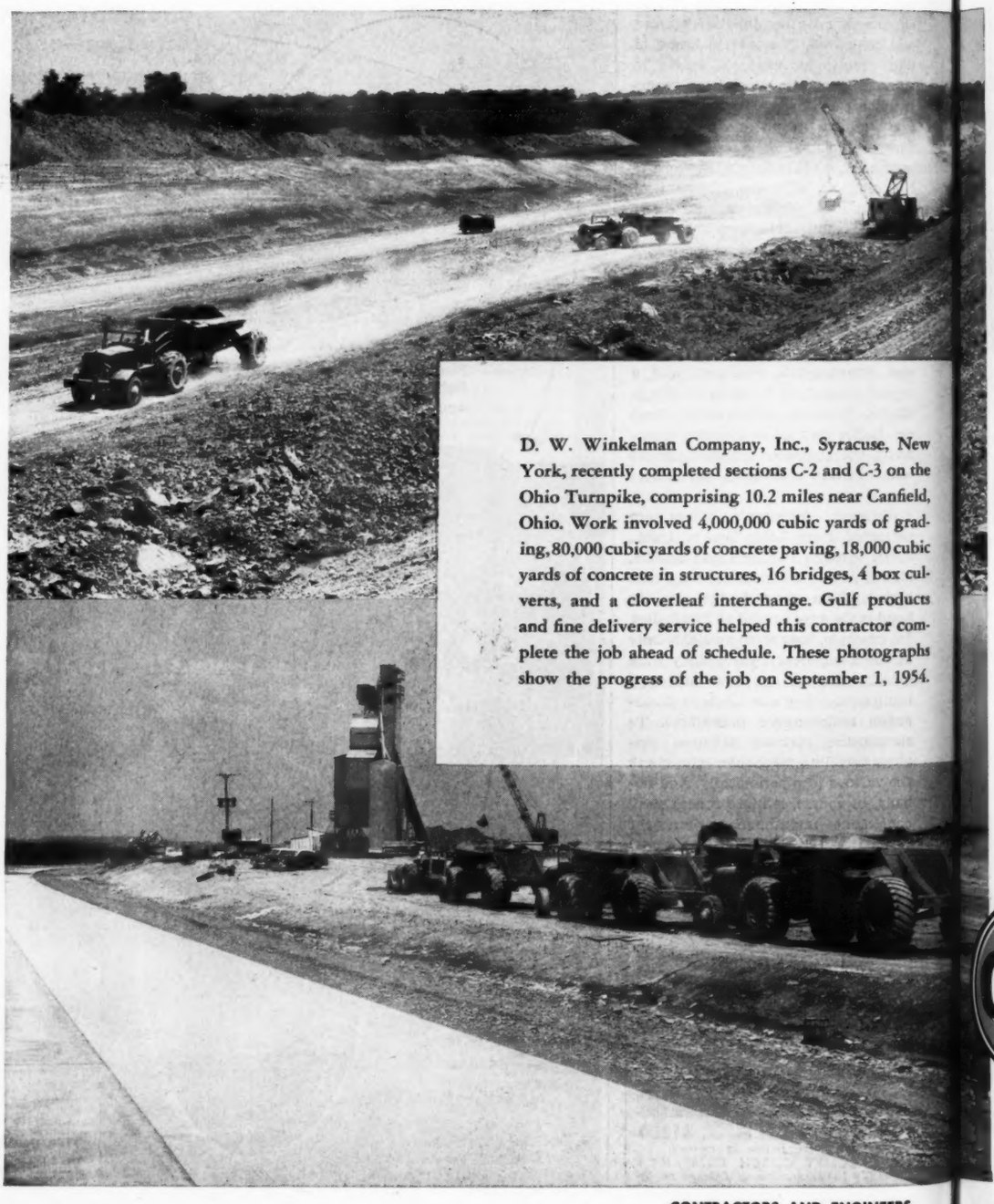
Measured by any standard, the equipment fleet is huge. Starting at the concrete end, for example, there is a Bucyrus-Erie 54-B shovel in the pit, along with a Caterpillar dozer. The hauling spread for this unit consists of a fleet of five Peterbilt trucks with Southwest bottom-dump wagons. The haul road traveled by these units is maintained by two Caterpillar No. 12 motor graders. A rock plant into which these units dump is a major setup calling for the maintenance of screens, jaw and cone crushers, conveyor belts, rod mills, sand scrubbers, sand screws, feeders, and gates. In connection with the concrete batching, there is a Johnson fully automatic batch plant to maintain, as well as a Fuller-Kinyon cement-handling system and a small army of diesel-driven General Electric locomotives. The 4-yard concrete buckets which handle the material also need maintenance, and even the units which haul these Gar-Bro buckets—converted Peterbilt trucks—were altered by the equipment maintenance forces in the South San Francisco shop.

For handling concrete, there are a Colby 240 and a Washington gantry-mounted revolving crane mounted upstream on the powerhouse, a Washington rig downstream on the powerhouse, and two Clyde Whirleys on the spillway. Later on there will be a Colby 200 on the non-overflow portion of the dam in Atkinson's contract, as well as a Colby 240 on the east fish ladder and an American R-25 on the dock. Proper maintenance, repair, and lubrication of these big units, mounted high in the air as they are, is a job in itself.

In between at this point comes the maintenance of many of the small items on which proper functioning of the job depends: vibrators, dewatering pumps, emergency diesel electric light plants for night operations, flat-beds, low-beds, pickup trucks, and the Motorola radio communication system which has done so much to reduce lost time and waste motion.

At the other end is a major ex-

GULF PRODUCTS



D. W. Winkelman Company, Inc., Syracuse, New York, recently completed sections C-2 and C-3 on the Ohio Turnpike, comprising 10.2 miles near Canfield, Ohio. Work involved 4,000,000 cubic yards of grading, 80,000 cubic yards of concrete paving, 18,000 cubic yards of concrete in structures, 16 bridges, 4 box culverts, and a cloverleaf interchange. Gulf products and fine delivery service helped this contractor complete the job ahead of schedule. These photographs show the progress of the job on September 1, 1954.

cavation spread. It includes 16,000 cfm of air capacity in Ingersoll and Gardner-Denver compressors, both stationary and portable. It includes a fleet of nearly two dozen Gardner-Denver wagon drills, a Bucyrus-Erie 120-B shovel, an 88-B, two 54-B's, and a Northwest 80-D. It includes a fleet of 15 Euclid end-dump trucks and a Caterpillar bulldozer fleet. All in all, it's an equipment fleet to lay a heavy package of responsibility before the master mechanic's door.

Organization

The preventive nature of the maintenance program is apparent in Throckmorton's organization, which parallels to some degree at least, the equipment spread itself.

The organization is small, totaling only 30 men. A shop foreman, six mechanics, four welders, three grease monkeys with their foremen, and a roving field mechanic in a radio car make up the day shift. While slightly smaller crews are assigned to swing and graveyard, the graveyard shift is one of the most important equipment-repair outfits on the job. It is up to this gang to catch all the loose ends left by day and swing shifts.

Throckmorton makes his rounds during the day, keeping in close radio contact with his shop office, with the head office on top of the hill, and with various foremen who have equipment working under their supervision. As various items which need attention are reported to him, Throckmorton simply jots them down on a written record so they will not be forgotten. As quickly as the flaws come to Throckmorton's attention, he also picks up his radio and flashes word to some mechanic to cover each item pronto. On-the-spot repairs are farmed out immediately to reduce lost time to a minimum. An impending breakdown which will, however, allow an equipment unit to finish out the swing shift, may be held over for graveyard-shift trouble shooting. Carrying this idea to its ultimate, long range major repairs to several equipment units are studied and parts ordered so that they will be available during winter shutdowns.

An integral part of the maintenance organization, of course, is the central repair shop. The shop is a tin building approximately 60×100 feet in size, well heated, and containing five heavy-equipment repair bays, welding shop, motor repair shop, steam cleaning room, paint shop, a parts stockroom, and a full range of heavy-duty tools. When a piece of heavy equipment enters one of the repair bays, the general idea is to have it out of there again in an absolute minimum of time. One of the ways this is done is through "drop in" units, such as spare engines and built-up rear-end units. On the floor, all ready to use at a moment's notice, are spare Cummins engines, as well as spare engines for the Peterbilt trucks. Downtime is further reduced by having ample crane capacity over each heavy-equipment repair bay so that heavy lifts can be made speedily and safely.

Experience Counts

According to every Atkinson official connected with equipment and its maintenance, the composite experience of many years is invaluable. Without exception, every master mechanic on Atkinson's payroll—and this includes Throckmorton—is a man with many years experience.

Other valuable data on the prevention of downtime is available from foremen, superintendents, and project managers who know how much work a piece of equipment will do without breaking down. One of Atkinson's best project managers found many years ago, for example, that a truck spotter was well worth his wages around each shovel, if for no other reason than the many extra hours of tire life this man made possible by kicking large sharp rocks out of the way. Such a man also earns his way by eliminating delay in truck spotting and raising general production. The company has raised the usable life of large-diameter tires to as high as 2,400 hours simply by thorough inspections, haul road maintenance, and good spotting.

One of the sources of friction in any organization is the transfer of broken-down equipment between jobs. Throckmorton has tried his best to eliminate this as far as equipment leaving The Dalles Dam is concerned. Suppose a wagon drill finishes up drilling in the navigation lock, and there is no more work for that unit in sight at the moment. Instead of setting the drill to one side and forgetting it, Throckmorton puts it aside only after a thorough inspection. What he finds then is correlated with what he had observed during the final few days the machine was working. If the unit needs repairs of any kind, it gets them immediately. It is then ready to be transferred to another job in good condition, or, if further work is done on the local job, the machine is able to hit full production at once.

Throckmorton's system, of course, includes complete records at his shop office regarding major repairs made to all items of equipment. Such records are absolutely necessary to a construction company in this modern competitive day if true repair costs are to be known at all. These and production records play perhaps the biggest part in the selection of new equipment.

Beyond these factors, Throckmorton insists there are no secrets to equipment maintenance.

"Good records, written notes concerning jobs to be done, a tight communications network, regular and competent inspections, and a prompt follow-through on the items you find will make any master mechanic appear to be better than he really is," The Dalles maintenance chief says

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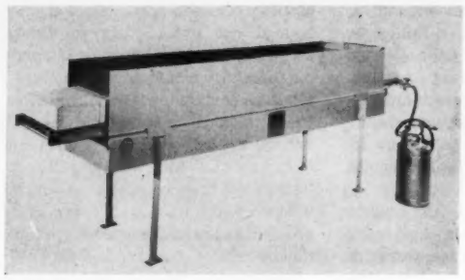
modestly. "It goes without saying, too, that any master mechanic needs the wholehearted cooperation of the general superintendent, the project manager, and the construction company's management to do the job right."

Throckmorton emphasizes that he has this to an unusual degree in the Atkinson organization.

Throckmorton's type of equipment maintenance is not at all unusual in the Atkinson organization. It is company policy which was begun many years ago by Guy F. Atkinson, now chairman of the board of the company, and passed down since by George H. Atkinson, president. Key officials at The Dalles Dam who give wholehearted support to this program include project manager John Morton, assistant manager Guy Heimsoth, and general superintendent Vernon Bradley. THE END



This specially designed heater provides workmen with a continuous supply of brick or masonry blocks that are dry and warmed on all sides.

Heater Warms Brick and Masonry Blocks

■ Brick and masonry blocks passed through a new Eclipse heater specially designed for the purpose are sufficiently warmed to permit building work to continue at colder temperatures than usual. Ice and snow-coated materials may be used immediately after going through the heater. Temperature of materials can be controlled by adjustment of the heating torches in the heater and by controlling the speed of flow of materials through it.

Constructed of only three parts—a one-piece hood with two free-swinging heat-control doors, a ball-bearing conveyor, and a welded furnace base, the heater is portable and easy to operate. Kerosene, light oil, or bottled gas may be used as fuel.

For further information write to the Eclipse Fuel Engineering Co., 1002 Buchanan St., Rockford, Ill., or use the Request Card at page 18. Circle No. 654.

USBR Engineer Retires

Walter E. Blomgren, assistant chief engineer of the U. S. Bureau of Reclamation at Denver, Colo., has retired after more than 42 years of government service, and is opening a consulting engineering office in Denver. He will specialize in irrigation and drainage developments both in this country and abroad.

CARCO winches held fast when slippage meant disaster

...on tough Alberta to Vancouver pipeline job

Towing and holding heavy equipment on steep grades is a severe test of a winch brake. On the Model J Carco winch, the automatic, self-energizing brake will hold any load the winch can pull. It takes hold the instant tractor clutch is disengaged. Full braking power comes from high ratio leverage contracting the band on brake drum. Brake unit is reversible, permitting under- or over-wind free-wheeling. Brake release mechanism gives the operator complete load control at all times. The load can be checked at any point and even be "inched" down. Brake is enclosed, protecting it from the elements or external abuse.

Mr. G. T. Guest, Assistant to Project Manager of Comstock Midwestern, Limited, builders of "Big Inch-by-Inch", says, "The job needed Carco winches for towing and holding heavy machinery on steep grades and even for holding men by life lines. Had a single winch failed, men and machinery would have been lost. We found Carco winches equal to everything we asked of them."

On top of hill a Model J Carco winch is winching the Carco J winch and International TD24 shown above up steep slope at Coquihalla Canyon while it, in turn, is winching up clam digger.

You can expect greater value from the leading producer, and get it from Carco, first in winch production. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Wash. Branches at Portland, Ore., and Franklin Park, Ill.

50th ANNIVERSARY PACIFIC CAR AND FOUNDRY COMPANY

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WINCHES

FOR ALL INDUSTRIAL TRACTORS

"NEWTYPE" SUCTION HOSE

Built to Help Your Pumps Give Their Best Possible Performance!

KINKPROOF— WON'T BUCKLE OR COLLAPSE

STYLE N-135

Here is the suction hose that really helps your pumps perform continuously at peak efficiency . . . it will not kink, buckle or collapse to retard the flow and slow down job progress. Even if accidentally crushed by heavy equipment, "Newtype" can be quickly put in shape again with mallet or hammer.

Goodall "Standard of Quality" materials and construction, including inseparable bonding of tube, carcass and cover, assure extra long service life. Extremely flexible . . . light in weight . . . easy to handle.

Sizes, 1¼" to 4" I. D., in maximum lengths of 50 feet.

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The McCarthy heavy-duty vertical drill made by the Salem Tool Co.

Vertical Drills Handle Wide Range of Jobs

■ The newest models of McCarthy heavy-duty vertical drills will handle augers up to 24 inches in diameter, with boring depths varying with auger sizes and earth formations. Augers 6 to 8 inches in size can drill to depths of 125 feet in earth, clay, compacted sand and gravel, hardpan, shale, and sandstone formations. With 12 to 16-inch augers, the units drill 60 to 70 feet in such material. Augers of 20 and 24-inch diameter are used successfully to depths of 16 to 30 feet.

New models feature two power output shafts. The high-speed shaft will handle 8-inch augers and under, while the slow-speed output shaft will handle augers of over 8-inch diameter at half speed. The manufacturer reports drillings of up to 800 feet per day varying with earth and rock conditions.

The drills are available with gasoline, diesel, or electric power source.

For further information write to The Salem Tool Co., Salem, Ohio, or use the Request Card at page 18. Circle No. 625.

Stops Engine Overheating Due to Rust and Corrosion

■ A simple method of preventing engine overheating due to rust and corrosion is offered by Sola Catalytic Co., 520 Browder St., Dallas 1, Texas. The company is marketing a catalytic cell enclosed in a brass container about 3 inches long that is inserted in the radiator of any water-cooled engine by a chain and ring. The catalytic action of the Sola auto cell disperses the elements in water which cause rust, scale, and corrosion, keeping them in a state of suspension or precipitating them so that they may be easily drained out of the engine.

It is emphasized that the catalytic action removes existing scale and reduces existing rust by a gradual dispersion process which reduces these elements to the consistency of mud. They are not flaked off in large segments.

A single Sola auto cell will protect the cooling system of the engine for a period of two years, preventing overheating and reducing friction.

The cell is 2 3/16 inches long × ⅝ inch in diameter. One cell treats up to 16½ gallons of circulating water.

For further information write to the company, or use the Request Card at page 18. Circle No. 727.

Descriptive Bulletins On Excavator Crane

■ Two bulletins describing the Wayne ¾-yard excavator-crane have been released by the Wayne Shovel & Crane Division, American Steel Dredge Co., Inc., 200 Taylor St., Fort Wayne, Ind.

In addition to specifications and lifting capacities, Bulletin No. 424 gives details on the operating features of the Model 70 crawler-mounted Wayne machine. Bulletin No. 425 lists specifications, capacities, and over-all dimensions of the 50A and 50B truck-mounted models.

To obtain Bulletins 424 and 425 write to the company, or use the Request Card at page 18. Circle No. 716.

Alfred Rheinstein, (third from left) who has served two terms as president of the Building Contractors and Mason Builders Association of New York City, is presented with a scroll in honor of his work on behalf of the association by Irving L. Lazere, president. Looking on are (left) Hugh M. Hughes, treasurer, and William Joshua Barney, Jr., vice president.

HOW TO HANDLE WET JOBS

L. I. LIGHTING CO.
POWER PLANT ADDITION
Glenwood Landing, N. Y.
Foundations: Hendrickson Bros.

WELLPOINTERS MASTER DEEP POWER PLANT CUT

DEEPEST SUBGRADE on this job was 23 ft below Manhasset Bay (see photo) and 29 ft below spring-fed ground water table. Underlying soil was sharp sand with a 6 ft overburden of very plastic clay. Maximum stability of excavation was mandatory to safeguard adjacent Power Plant and highway.

• Operating frequently in "Wellpoint Country," this heavy construction contractor encounters many wet jobs and has learned from repeated experiences how helpful Griffin engineers can be. Dry, stable working conditions were achieved quickly and economically in spite of high head and tricky working conditions.

• When a wet job calls for know-how, call for Griffin.

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In Canada: Construction Equipment Co., Ltd.
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Gentlemen: Please rush complete TRUCK TRACK details and prices for:

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☐ Dual Tires ____ x ____ ____ (inches) Center-to-Center Axle Spacing

Name ____
Address ____
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My Local Equipment Dealer is: ____

Safety makes for speed at The Dalles Dam

An unusual safety program is one of the factors contributing heavily to the fast work pace on the 1,746,000-kw power plant being built at the site of The Dalles Dam on the Columbia River. Because calculated measures are being taken to reduce working hazards, contractors' crews have been able to hit a better-than-average speed on the huge project.

Late last year, when work on the plant was running nicely ahead of schedule, a report from the U. S. Army Corps of Engineers district office at Portland, Oreg., showed an accident-frequency rate for The Dalles Powerhouse Constructors of 8.7. State averages at the same time were from 35 to 50. The same report showed a severity rate of 3.74, compared to a state average of over 5 for similar heavy-construction work in the state of Washington.

These figures, according to officials of The Dalles Powerhouse Constructors, are not unrelated to the work pace being maintained on the project. In fact, the unusually effective accident-prevention program is responsible in large measure for the speedup of the construction schedule. Prompted by humanitarian as well as business motives and administered by trained experts, the program is aimed at getting cooperation from foremen and the various crafts for everybody's benefit. "Tool box" meetings are paying off in both better production and lower insurance rates.

Work on The Dalles Dam by The Dalles Powerhouse Constructors, a joint venture, represents some of the heaviest construction work in the state of Washington. Projects of this kind are loaded with hazards. The big powerhouse, which ultimately will be the longest in the world, requires men to work at extreme heights. Heavy cranes swing loads in and out of the work area with monotonous regularity. And there are a host of dangers from minor causes.

Yet, a recent accident report showed that 1,430 men had worked a total of 260,043 man hours during one month, while suffering only two lost-time accidents for a frequency rate of 7.7 and a severity rate of 0.37. This record made The Dalles Dam stand out as a prime example of Corps of Engineers safety, and enabled the Portland district to lead the rest of the northwest in that regard.

Planned Program

Project manager A. R. Bacon, of The Dalles Powerhouse Constructors, feels that a safety program is no more than his moral obligation to his men. If the program is designed right, Bacon believes it will fulfill this obligation—and if incidental benefits result, so much the better. The program has been set up along those lines with the same thoroughness brought to planning batch plant capacity, the strength of forms, or the daily production of concrete.

Basically, the safety program is designed to meet all current safety requirements of the Corps of Engineers, the safety standards of the state of Washington, and the accident-

Gets back on new slab sooner — speeds paving schedules

KOEHRING 16-E *twinbatch*® paver on rubber tires is as mobile as your batch trucks. It works on or off-pavement — can get back on new slab in as little as 7 days to pave adjoining highway strips, scattered intersections, approaches to driveways and side roads. This time-saving "run-about" makes self-powered moves at 9 m.p.h. Yet, for all its mobility, the Koehring 16-E *twinbatch* is primarily a production paver — exceeds the output of large single-drum pavers on main highway work. For instance —

On straight-production paving, the Koehring 16-E hits a top output of 86.7 batches an hour (based on 60-second mixing cycle). This *reserve* production capacity with *twinbatch* Autocycle mixing offsets normal job delays — lets you pick up lost time which cannot be made up with a limited production single-drum paver.

Averages 50 cu. yds. an hour

As a result, the Koehring 16-E *twinbatch* easily maintains an average of over 76 batches an hour — 8 hours a day. Based on 16 cu. ft. per batch, plus the usual 10% overload, this assures you 50 cu. yds. of concrete per hour — with a small crew — on your main-highway paving jobs.

While its usefulness is unlimited as a general-purpose paver, this versatile Koehring 16-E also serves as a mobile concrete mix plant. On construction of curbs, gutters, culverts, bridges, pilings, it discharges into overhead hoppers, forms, chutes, or loads trucks. Elevating boom reaches up and out 60° — gives controlled discharge at 21-foot height (higher with special boom).

See for yourself how the big production capacity, overall versatility, and rubber-tired mobility of this Koehring 16-E *twinbatch* can put you miles ahead on your paving schedules. Get all the facts from your Koehring distributor, or write us for 16-E catalog. Big 34-E *twinbatch* is also available for major highway, airport paving.

KOEHRING Company
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(Koehring Subsidiaries: JOHNSON • PARSONS • KWIK-MIX)

◄ Safety measures on The Dalles Dam project include warning signs on power-line poles. The lines themselves are strung 90 feet above the grond for safety.
Ray Day Photos

This load of aggregate heading for The Dalles Dam crosses the state highway without hazzard because of the four-way traffic light and warning sign installed at the intersection by the dam contractors. ►

prevention program of the Associated General Contractors of America. The program has ten component phases: 1. The Accident Prevention Committee; 2. The project safety engineer; 3. Employee indoctrination; 4. Safety meetings; 5. Posters and signs; 6. First-aid; 7. Public safety; 8. Fire protection and prevention; 9. Accident investigations and reports; 10. Subcontract provisions.

The Accident Prevention Committee consists of contracting-firm heads, who meet with the resident engineer of the Corps of Engineers to set broad policy regarding safety and fire protection on the job. It is this committee which demonstrates to everyone on the job that management is solidly behind the safety program. The proper execution of the safety program is one of the responsibilities of this committee.

For The Dalles Powerhouse Constructors, the committee includes project manager A. R. Bacon, project engineer William Davis, general superintendent John Heckart, and project safety engineer H. S. Latham. Representation from the Corps of Engineers is headed by resident engineer H. B. Elder. These men, all conversant with modern construction and safety practices, meet twice a month to determine preventive policy.

The project safety engineer portion of the program calls for the employment of a full-time safety engineer to administer the safety program. In line with this phase of the program, the contractors secured the services of project safety engineer H. S. Latham, an experienced accident-prevention expert who directed the safety program at Hungry Horse Dam, and prior to that was associated with Liberty Mutual Insurance Co.

One of the very important parts of the safety policy is employee indoctrination. The management of The Dalles Powerhouse Constructors never assumes that a man can be hired and left to shift for himself. Under this "employee indoctrination" heading, the time office issues every new employee a copy of the company's safety regulations, which is printed either in pamphlet or mimeographed form. This is done the first day he signs up. At the same time, the job warehouse issues to new employees hard hats and other protective clothing as required. Many accidents involving falls from high places have been prevented, because there are over 400 MSA safety belts on the job. Carpenters have found that these safety belts not only protect them on forms high above the powerhouse floor, but also allow them to work with two hands instead of one.

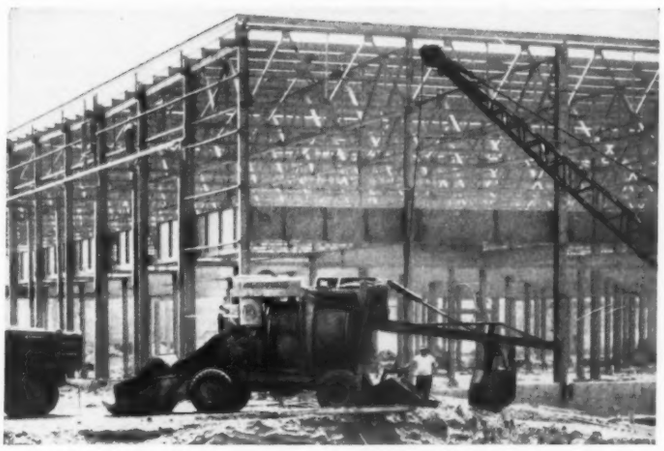
Of all the things which go into employee indoctrination, nothing, according to Latham, is more important than the participation of foremen in this responsibility. At The Dalles powerhouse, each foreman is responsible directly for indoctrinating new employees under his supervision. This foreman is expected to explain the job in detail, to inform the new employee to report promptly all injuries, however minor, and to point out and stress the worst hazards inci-

Big rubber-tires are easy on the sub-grade

Notice how there's little or no scuffing on the sub-grade with a Koehring rubber-tired 16-E paver. When working between forms, flotation of the big 11:00 x 20 pneumatic tires protects the grade against surface damage — saves unnecessary filling and re-leveling. This rubber-tired advantage also lets the Koehring 16-E *twinbatch* work on pavement without planking to pour adjoining slabs, widen highway and airport strips, pave intersections, pour concrete for curbs, gutters, culverts.

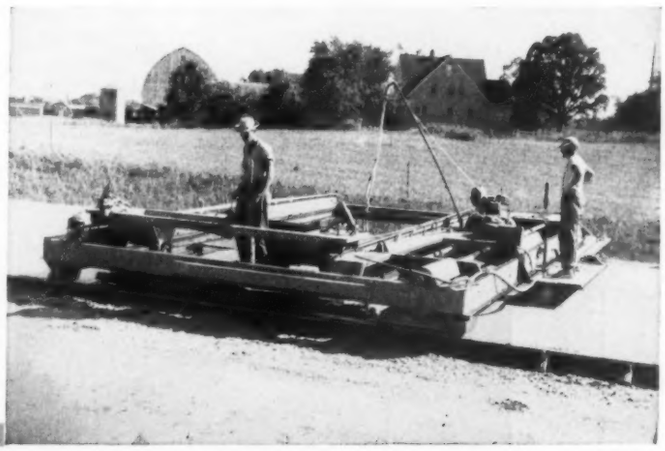
Mobile 16-E paver serves as a concrete mix plant

On building construction, versatile Koehring 16-E *twinbatch* pours footings, floors, columns — is never "grounded". Power-controlled boom swings in a 160° arc, or elevates 60° for overhead discharge — locks and holds in any position. Controlled-discharge bucket dumps anywhere along the 25-foot boom, can be opened or closed at any time for gradual discharge. Water-level capacity of bucket is 24 cu. ft. That's more than ample capacity to hold the full 16 cu. ft. batch of concrete, plus 10% overload.



Precision finisher keeps up with any paver

"Timely", precision-finishing is important on any paving job. Operating at almost twice the speed of a 34-E paver, Koehring Longitudinal Finisher handles all practical consistencies of concrete—harsh, wet or dry. It overcomes slump difficulties on grades and elevated curves. Produces mechanically accurate concrete slab surface, 8 to 30 feet wide, with uniform crown transitions.



KOEHRING HEAVY DUTY

dent to the job. The foreman is also directly responsible for providing safety equipment such as safety belts, life preservers, and goggles, and insisting on their proper use. Each foreman is directly chargeable for the proper managerial follow-through, and regular checking makes absolutely sure that every green hand is performing his work efficiently and safely.

Safety Meetings

According to Latham, nothing makes a man more safety conscious than his participation in regular safety meetings. On this job, safety meetings are split into two divisions, the first of which consists of regular foremen's meetings. These 30-minute get-togethers, conducted by the project's safety engineer and attended by all superintendents and foremen, consider the work and accident prevention in broad form. The sessions are scheduled for the second Wednesday of each month, immediately after the end of the shift. Indoctrination of foremen and superintendents in the company's safety policies is the aim of these meetings.

But the most effective safety meeting, by far, consists of a weekly "toolbox session," lasting about ten minutes and including each foreman and his crew. These short meetings, which are held at the start of the shift every Monday, are prepared for in the minutest detail. Each foreman is furnished with a breakdown of accidents the previous week, giving names involved, the cause of the accident, and pertinent preventive literature—usually from the safety manual of the Associated General Contractors of America. Bacon, Heckert, and Latham have built up rare competition among their foremen to the point where these meetings are never perfunctory; they represent a real example of teamwork between each foreman and his gang. More than any other factor, Latham feels, they serve not only to prevent accidents but to correct bad practices, speed production, and lower costs. Good cost-cutting suggestions have come from these sessions, too.

Each foreman's Monday time report shows that his safety meeting was held and reports the general subject matter which was discussed.

The fifth phase of the safety policy consists of posters and signs. Under this division, all necessary hazard and warning signs are posted wherever they are required. There is a large sign with a safety slogan, the company name, and the National Safety Council current bulletin at the entrance to the job. There is a monthly frequency and severity rate, with lost-time accidents by crafts, which is posted on an appropriate sign near the job access road. National Safety Council posters also are put up at various locations on the job and are changed each month. The Dalles Powerhouse Constructors belong to the construction section of the National Safety Council and use NSC's bulletins and literature to excellent effect. Various chapters of the AGC safety manual also have been reproduced in pamphlet form for distribution to the various crafts.

First Aid

First aid, of course, is a vital necessity in any safety program. At The Dalles powerhouse, it consists of a first-aid station adequately equipped and manned jointly by The Dalles Powerhouse Constructors and Atkinson Ostrander Co., who also have a portion of the powerhouse substructure work. This first-aid station is staffed by an experienced attendant 24 hours a day. There are also small 16-unit first-aid kits in job pickups and in field offices all over the project. First-aid is so accessible to any employee that there is absolutely no reason why he should fail to report any injury, no matter how slight.

The first-aid portion of the program is also being supplemented by Bureau of Mines safety instructions for all foremen. Several complete courses have been held so far to acquaint the foremen with artificial respiration, application of tourniquets, and other such important emergency measures which may save a life.

Safety for the public has been achieved without a loss of good will. The Dalles Dam is one of the most spectacular projects in the Pacific northwest as far as the public is concerned, but the visitor and the contractors are both protected. Passes releasing The Dalles Powerhouse Constructors from liability in the event of injury are issued to all visitors. Visitors are also furnished hard hats and other safety clothing they may require, and particular attention is called to hazards before they visit the job. This is usually done by the section head at the main office.

While the best accident-prevention programs in the world fail somewhere along the line, The Dalles Powerhouse Constructors has held these failures to a minimum. However, accident investigations and reports must of necessity be a part of the safety program. These include a running up-to-date record of all injuries, both lost time and non-lost time, the monthly compilation of accident frequency and severity rates (together with an accident analysis for use in preventing recurrences), and the investigation of all lost-time accidents by the safety engineer and the supervisor involved. The safety branch also prepares the necessary reports required by the Corps of Engineers and the State Division of Safety in connection with non-lost time and lost-time accidents.

Fire prevention and protection is an important part of the safety program, as well as one of the secrets of the good construction schedule. Every dam builder is familiar with disruptions to schedules caused by such in-

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New Cost-Reducing Features Keep FLEX-PLANE Detroit Special Best Finishing Machine Buy

If you get all the facts before you buy a finishing machine — you'll buy a Flex-Plane Detroit Special.

Here are a few of the reasons why. It's the most portable machine to ever take the forms. It requires no extra labor, cranes or large trucks to be moved from job to job. No "extra hands" needed and no crew waiting.

It's the most adjustable machine ever assembled. The **Two-in-One** working width means just that. Other equipment available today permits, at the most, only five foot range in adjustability. **Flex-Plane's super Two-in-One adjustability more than** doubles this range of working widths.

It's custom-built to your particular needs. You give us your requirements and we'll build a Special that will fit them. A tough, rugged worker that will stand up under continuous use with a minimum of maintenance.

But get all the facts. Get the new 16-page documented booklet! Hear the story from other contractors! Watch it work! Compare it — and you'll join the ever increasing number of contractors who have found the answer to all finishing problems — **the amazing Flex-Plane Detroit Special.**

SELF-POWERED the Detroit Special will maneuver under its own power to position itself into the most advantageous hitching position.

POWER PLUS! The Detroit Special's heavy duty transmission enables the machine to work harsh, low slump concrete up to 35 feet in width with ease. Frequently does double duty as a spreader.

cidents as batch-plant fires. The fire prevention and protection program provides for the installation of adequate fire-fighting equipment, such as tank trucks, stand pipes, and fire extinguishers. Latham also has selected and trained a fire-fighting detail for each shift.

Last, but not least, are subcontractor provisions. These safety provisions include a letter which goes to each subcontractor informing him of his obligation to enforce the safety requirement of the specifications. In each subcontract a clause is inserted requiring the subcontractor to comply with the safety provisions of the specifications and to hold weekly "tool-box" safety meetings, as does the prime contractor. Subcontractors are also required to furnish monthly accident reports, and to stand for frequent inspection of their operations by the management of the prime contractor.

In those ten broad divisions of The Dalles safety program lie the keys to results which have slashed Washington's state accident averages. Up until late last year, the contractors had worked 16 months with but one fatality, despite work which is abnormally heavy and dangerous.

Biggest Hazard

According to Latham, possibly the worst hazard on the powerhouse is the operation of the equipment. Although all the gantry-mounted cranes are equipped with boom stops, date tags on the concrete bucket load lines, and every known safety device, they were recently subjected to actual load tests also. The Dalles Powerhouse Constructors tested each of its cranes to 150 per cent of its rated capacity at the maximum boom angle, and to 125 per cent of its maximum expected performance.

Workmen hanging by safety belts not only work safely, but have increased efficiency because they can use both hands. Here reinforcing steel is being prepared for a powerhouse wall pour.

The bulletins and literature of the construction section of the National Safety Council have proved to be extremely valuable. So have the various chapters of the AGC manual of accident prevention in construction.

On the basis of many a safety man's belief that any lost-time accident costs the contractor approximately $800 in lost time, compensation, interference with production schedules, and other such causes, the unique and enviable safety record at The Dalles powerhouse is saving approximately $20,000 per year, if the job is compared to the Washington state average for heavy construction. But Heckart, Latham, and Bacon would rather not evaluate their accident-prevention program in monetary terms. They feel that a safety program will work if it's geared to humanitarian motives, but may fail if the dollar sign shows through.

A resume of safety "business" for one month—September, 1954—reflects accurately how men get hurt in building a heavy concrete powerhouse. A breakdown of accidents suffered that month reads as follows:

Type	Total Accidents
Striking against objects	35
Eye injuries	30
Lifting strains	22
Struck or cut by hand tools	17
Struck by flying object	14
Struck by falling object	12
Stepping on object	13
Slips causing strains	11
Falls on the same level	11
Burns	6
Falls from one level to another	6
Caught in or between	5
NOC handling objects	1
Infections	1
NOC	1

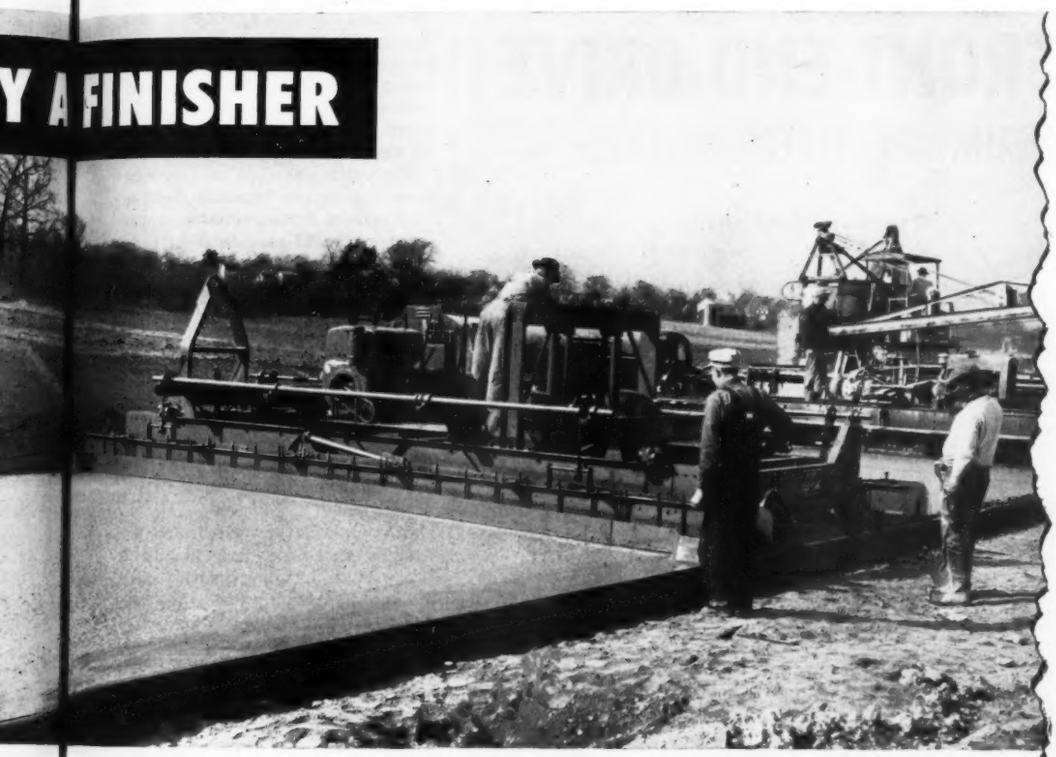
(Note: a fall from one level to another and a falling object caused the only two lost-time accidents during the month.)

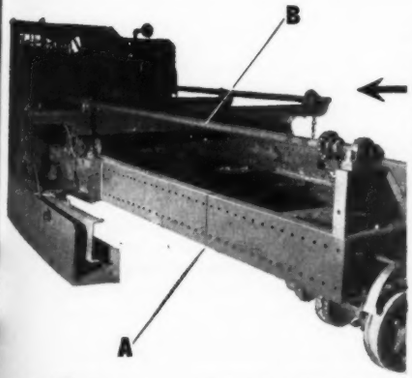
Originator of this workable safety program is the entire joint-venture firm called The Dalles Powerhouse Constructors. The firm is composed of nine construction firms from Minnesota, Iowa, and Montana. The Portland District Office of the Corps of Engineers, headed by Col. J. U. Moorhead, district engineer, is supervising the contract.

The Dallas Powerhouse Constructors has moved a huge $29,820,997 substructure contract out ahead of schedule, and has done its best to prevent injuries in the bargain.

THE END

Y A FINISHER





UNMATCHED ADJUSTABILITY is possible because of extra length frame and drive shaft. Even when machine is extended to maximum (Arrows A & B) there remains a tremendous overlap which gives the Detroit Special unmatched stability in the extended position. You don't sacrifice rigidity or finish quality to have extra width.

SUPER SCREEDS mounted on the standard Detroit Special have 12" bottoms — a total of 24" of screeding surface —widest in the field. For even finer screeding the extra-wide Flex-Plane Compound Screed (right) with a 20" bottom, is easily worked by the Detroit Special.

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COMPANY.....

STREET.....

CITY.....STATE.....

A comprehensive handbook of excavation

MOVING THE EARTH, By Herbert L. Nichols, Jr. 1,280 pp. $15. Copies may be ordered through this magazine. (See page 68.)

To Archimedes, earthmoving was a theoretical possibility—given a lever big enough, a point for the fulcrum, and a place to stand. To modern contractors, it is an everyday actuality—a gigantic industry employing many thousands of men and some of the heaviest machinery developed. Herbert Nichols has taken a long careful look at this huge industry and set himself the task of describing its many phases.

That he has succeeded is demonstrated by "Moving the Earth", a 1,280-page illustrated volume which details virtually every problem of excavation. Written in nontechnical language, the book nevertheless treats thoroughly the intricate aspects of hundreds of operations which fall under the category of earthmoving.

The book is divided into two major sections. Part One consists of 11 chapters dealing with the work, with methods and procedures for every operation from land clearing to dewatering. Part Two includes ten chapters devoted to the operation, maintenance, and repair of the machines used in these jobs. An abridged version of this latter section was published last year under the title "How To Operate Excavation Equipment".

The enormous scope of this new book (the author rightfully calls it "A Workbook of Excavation") is indicated by the 15-page table of contents. Chapter 1 discusses land clearing, describing everything from brush cutting to stump pulling and blasting. Chapter 2 deals with levels and locations. Chapter 3 treats soil and mud, with emphasis on every kind of digging operation, capacities of the different kinds of equipment, and the pesky problem of stuck equipment. Chapter 4 covers cellar and foundation work, and Chapter 5 describes dewatering.

Chapter 6 is devoted to ponds, swamps, and dams, and Chapter 7 treats landscaping and agricultural grading. Chapter 8 contains a complete treatment of the grading phase of road building, Chapter 9 discusses rock blasting and tunneling, and Chapter 10 offers descriptions of various pit operations. Chapter 11, titled "Making and Losing Money", includes consideration of contracts, costs, selection of machinery, insurance, bonds, and other business aspects of the industry.

Part Two begins with a chapter on mechanization in general, treating in some detail basic parts of standard machinery. Subsequent chapters discuss revolving shovels, conveyor machinery, tractors and bulldozers, tractor loaders, scrapers, dump trucks and wagons, graders, compressors and drills, and miscellaneous machinery such as pumps, aggregate plants, and lubricating equipment.

Throughout the book, alternate methods of performing an operation are discussed and their merits pointed out. Consistent attention is given to problems of maintenance and repair, protection of both equipment and operator, and economy of operation. More than 2,000 illustrations help detail both the work and equipment. Helen Schwagerman has contributed excellent line drawings of equipment and work patterns, and there are hundreds of tables, charts, and maps. Some photographs of equipment are also included.

The author's style is an easy one, almost conversational in that it

New! BMCO FRONT-END DRIVE
SELF-PROPELLED PNEUMATIC TIRED ROLLERS

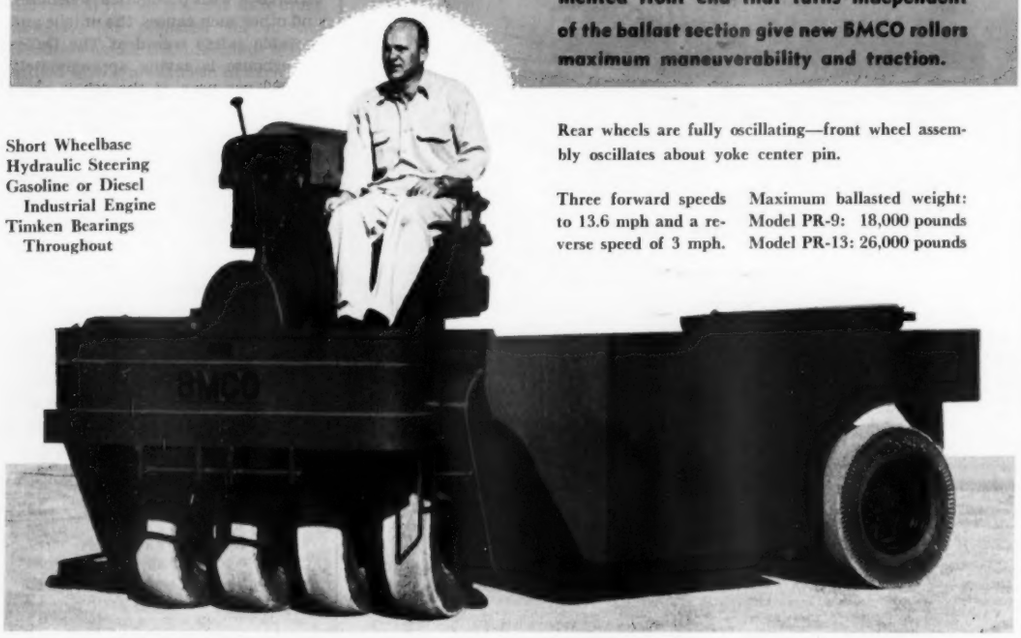
Power on all front wheels and unique segmented front end that turns independent of the ballast section give new BMCO rollers maximum maneuverability and traction.

Short Wheelbase
Hydraulic Steering
Gasoline or Diesel Industrial Engine
Timken Bearings Throughout

Rear wheels are fully oscillating—front wheel assembly oscillates about yoke center pin.

Three forward speeds to 13.6 mph and a reverse speed of 3 mph.

Maximum ballasted weight:
Model PR-9: 18,000 pounds
Model PR-13: 26,000 pounds

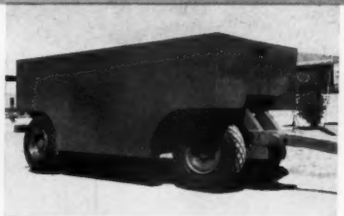


Engine, controls, and operator's seat are all mounted in segmented front roller section and turn with the front power wheels. This unique design plus power on all front wheels gives the new BMCO front-wheel-drive pneumatic tired rollers unheard-of traction. Fast skid-proof turns are made within a radius of 15 feet. Two models with 9 and 13 tires give full 66 and 95-inch rolling width coverage.

BMCO Rock Buster

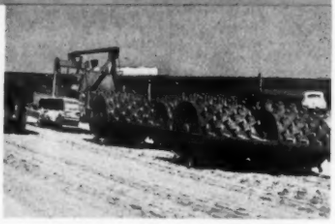
Breaks and crushes oversize rock in pit run materials right on the roadway for base courses. Reconditions old asphalt road materials.

BMCO 50-ton Compactor



Three wheels front and four rear, are staggered for complete coverage and oscillate to equalize ground pressure.

BMCO Sheepsfoot Rollers



Available in single, double, and triple drum models with effective rolling widths up to 14 feet.

For details write to: Browning Manufacturing Co. 111 Humble Ave., San Antonio 6, Texas

speaks directly to the reader without unnecessary attention to rhetorical niceties. The text refers repeatedly to accompanying illustrations in explaining specific operations.

Herbert Nichols is a contractor with more than 20 years experience on which to draw. He has consulted both manufacturers and other contractors in preparing this work, and has not ignored the varying conditions and practices found in different parts of the country. A 27-page glossary and a 35-page index are especially helpful if the book is used as a reference.

Like last year's "How To Operate Excavation Equipment", this work will appeal to both the layman and the professional. The former will find it a fascinating introduction to the spectacle of large-scale earthmoving; the latter—whether student, novice, small-scale operator, or large-scale contractor—will find it an invaluable guide. Clifford S. Strike, president of F. H. McGraw & Co., well known big construction firm, says in the foreword: ". . . I can think of no earthmoving problem which this book doesn't cover . . . a reference book like "Moving the Earth" could have saved our construction crews time and money. . ."

Large clear type on high-quality paper makes the book easy to read. The handsome binding is of Fabrikoid and is stamped in gold.

Copies of "Moving the Earth" may be ordered through this magazine (see page 68). THE END

Uses and Advantages Of Emulsified Asphalt

■ The use of Bitumuls emulsified asphalt and the advantages it provides in pavement construction are discussed in a new booklet from American Bitumuls & Asphalt Co., 200 Bush St., San Francisco 4, Calif. Bitumuls Mixing Grade emulsified asphalt consists of paving asphalt dispersed as very small globules in water.

Beginning with a description of the product, the booklet follows step by step the preparation and placement of Bitumuls mixes. The bulletin stresses the ability of Bitumuls to mix with and actually improve the quality of readily available or even in-place native aggregate.

The emulsified asphalt readily coats non-cohesive materials. It is pointed out that fast and efficient mixing, generally without the necessity of heating, results in savings in time, manpower, and equipment. Delays due to inclement weather are also reduced since Bitumuls is compatible with moisture.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 715.

Concrete Form Accessories

■ The Conver line of building and concrete specialties is illustrated in a new catalog available on request.

The literature lists accessories for concrete form work, reinforced concrete, furring and lathing, and fireproofing. It also describes concrete inserts, masonry wall anchors and ties, and ceiling hangers.

To obtain Catalog 55 write to Conver Steel & Wire Co., Inc., 600 E. 132nd St., New York 54, N. Y., or use the Request Card at page 18. Circle No. 740.

Hydraulic Pipe Bender

■ A folder showing the operating features of the recently announced Greenlee No. 880 hydraulic pipe bender is available on request. Of lightweight aluminum construction, the bender operates with a separate pump, ram, and bending shoes for pipe ½ to 2 inches in size.

The literature also shows the bender being powered by the Greenlee No. 798 hydraulic power pump, used to speed production on large orders.

The cylinder block of the No. 880 bending ram fits the attachments of other Greenlee benders so that the pipe-bending equipment will also bend thin-wall conduit and tubing.

To obtain this literature write to Greenlee Tool Co., 2136 12th St., Rockford, Ill., or use the Request Card at page 18. Circle No. 723.

This rock bucket for the No. 6 Traxcavator loader is one of two new Caterpillar products.

New Equipment for Tractor and Loader

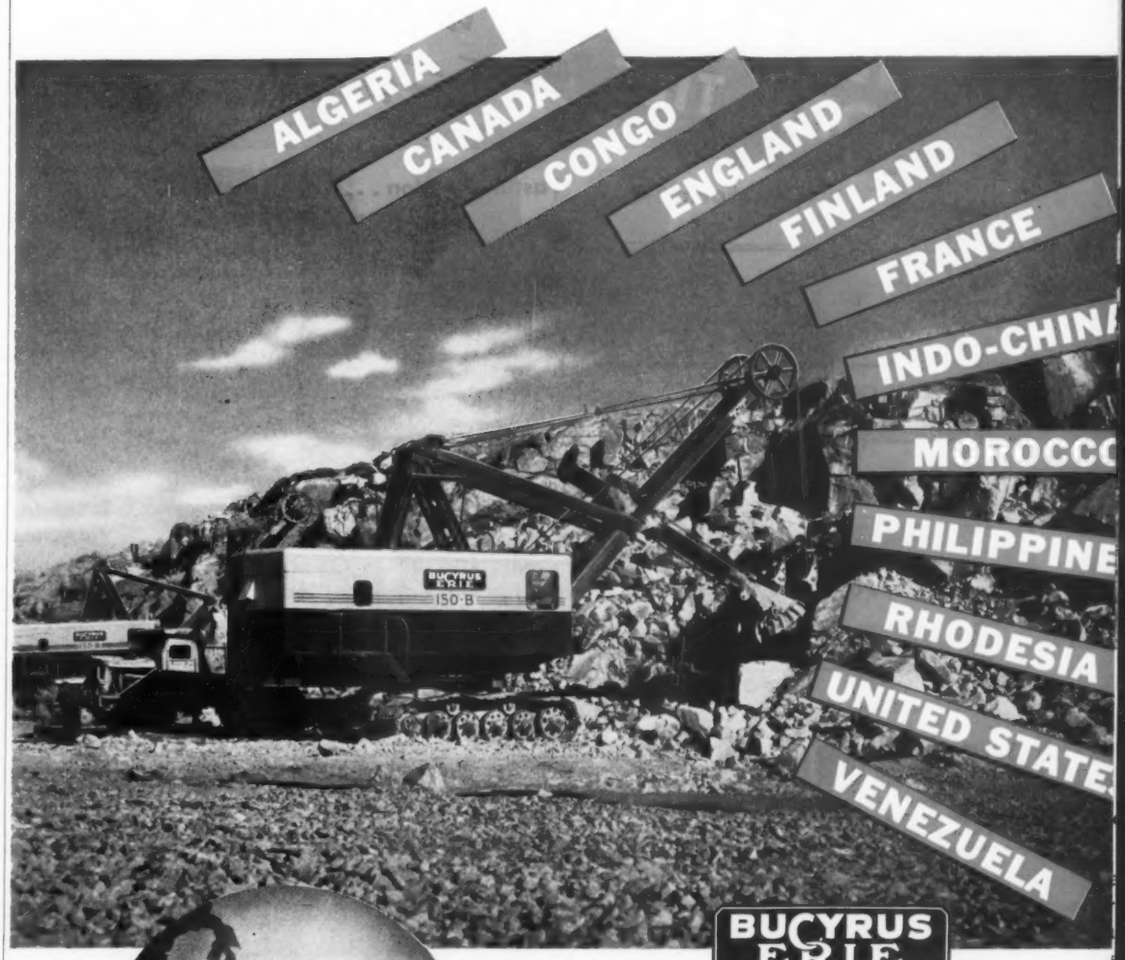
■ Among recent improvements announced in Caterpillar products are a new track roller frame for the D8 tractor and a skeleton rock bucket for the No. 6 Traxcavator loader.

The new seven-roller oscillating-type track roller frame will provide the D8 tractor with increased traction, flotation, and stability. Use of the new frame requires a 42-section track in place of the standard 39-section track, as well as modifications for bulldozers and the No. 46 hydraulic control used with the D8.

The rock bucket for the No. 6 Traxcavator is designed to handle clean rock such as riprap and provides a grizzly action that segregates smaller material. This new two-position bucket is 96 inches wide, has a 1½-cubic-yard struck capacity, and tilts back 11 degrees at ground level.

For further information write to Caterpillar Tractor Co., Peoria 8, Ill., or use the Request Card at page 18. Circle No. 608 for the new track roller frame and No. 609 for the skeleton rock bucket.

GLOBAL APPROVAL



110-B 4½ cu. yds.
150-B..6-cu. yds.
190-B..8-cu. yds.

Scores of these outstanding excavators have proven their worth in varied quarrying, mining, and heavy-duty construction projects all over the world.

Remember, FOR THAT EXTRA MARGIN — in design, in construction, in all round performance, and, above all, in output — it's BUCYRUS-ERIE Ward Leonard electric excavators. 46155C

BUCYRUS-ERIE COMPANY

South Milwaukee, Wisconsin

New Process for Testing Used Engine Oil in Field

Running a Shell ADC Oilprint Analysis is a simple operation for a trained technician. Oil spots on this filter-paper chart are receiving a drop of special indicator fluid which colors the oil and indicates basicity of the lubricant.

A method of running quick field tests for immediate evaluation of used lubricating oils has been developed by Shell Oil Co., New York, N. Y., and is already being used—under the direction of Shell technicians—by maintenance supervisors of large automotive fleets.

Called the Shell ADC Oilprint Analysis, the method involves simple chromatic testing of oil to determine the degree of dispersancy, contamination, and basicity. Although the primary function of the analysis is to ascertain proper oil-change intervals for individual engines, its use reportedly has also cut costs of engine maintenance by disclosing mechanical defects before they could cause engine failure.

To perform the test, a technician puts two drops of oil from an engine's crankcase on a sheet of filter paper and adds a drop of special color solution to one of the spots. Within 5 to 10 minutes, the spread of each drop of oil has assumed a pattern (and in the case of one of the spots, a color) which may be readily analyzed by a trained technician. If negative in any of several aspects, the test may indicate the need for a prompt oil change —thus preventing possible engine failure and costly repairs.

In a recent press demonstration of the testing method, Shell spokesmen reported that the tests have been in use in the field for nearly two months. Many times, it was announced, the tests revealed faulty oil filters, thermostats, cooling systems, injectors, and other parts which were repaired or replaced in time to avert lost time and costly replacements.

The formulized indicator which is added to a drop of oil to evaluate basicity count is a special preparation of Shell laboratories and will remain in the hands of Shell technicians. Other phases of the test—those indicating dispersancy and contamination—will be taught to personnel of large automotive fleets for application in the field. Trained personnel at most large Shell industrial or commercial outlets will work with these fleets in running the chromatic tests for basicity.

Because the complete test requires certain knowledge of engine operation and the conduct of particular oils, the analysis must be conducted by trained personnel. For this reason, Shell will limit its availability to large fleet accounts. The tests will not be available at retail service stations.

The new test is seen as an important timesaver for contractors and others who operate large truck fleets in the field. Because of the speed with which an appraisal can be made, time lost in obtaining laboratory analyses is eliminated and considerable economies are effected.

Chip Spreader Shown Is Self-Propelled Unit

■ The self-propelled chip spreader made by Flaherty Mfg., Inc., P.O. Box 1042, Pocatello, Idaho, is illustrated in literature available on request.

Using a two-man crew, the Spread-Master machine makes spreading of chips a continuous operation. It is not necessary to stop the spreader to hook and unhook the trucks delivering cover-coat material. This permits immediate coverage of applied oil.

The Spread-Master is also recommended for road sanding in ice control, blotter application, and sand-sealing. The machine also handles coarser aggregate.

Powered by a 57-hp Minneapolis-Moline engine, the Spread-Master has a road speed up to 15 mph. The speed can be increased to 25 mph for long moves. Power steering improves the control of the machine.

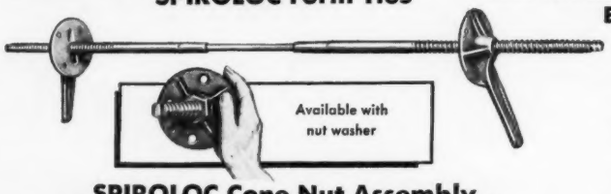
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 732.

UNIVERSAL FORM TIES

a Complete Line From 1 Source

SPIROLOC Form Ties

Faster Erection . . . Positive Holding . . . Easier Stripping



- Greater tie strength for heavy construction
- Fewer ties per sq. ft. of form area. LOWER MATERIAL and LABOR COSTS
- Positive breakbacks
- Permanent, reuseable equipment
- RENTED . . . SOLD

SPIROLOC Cone Nut Assembly

The most positive internal spreader and form tie

TWISTYES | SNAP TIES

Positive Spreader Ties for all types of Concrete Construction

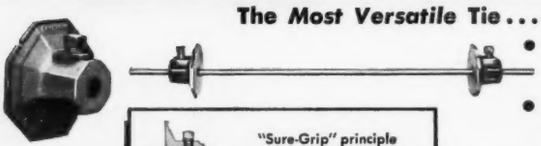
Combination wedge and bearing plate . . . easy application . . . won't twist or fall off —ample take-up.

- Low cost ties for job-built or prefabricated forms
- Used with or without walers
- Accurate breakback . . . minimum plug required
- Choice of Spreader Washer . . . 7/8" flat is standard
- Rugged Twistye and Snap Tie Clamps have extra bearing surface . . . additional safety factor

Curved ends speed installation and stripping . . . long slope wedge for ample take-up. Extra nail holes permit nailing clamp in any position.

FORM CLAMPS

The *Most Versatile* Tie . . . At the Lowest Cost



- 2 Form clamps and a mild steel rod make a tie to handle any condition
- Wide clamp base gives more bearing on waler . . . won't "bite" at maximum loads
- Notched base permits nailing to waler

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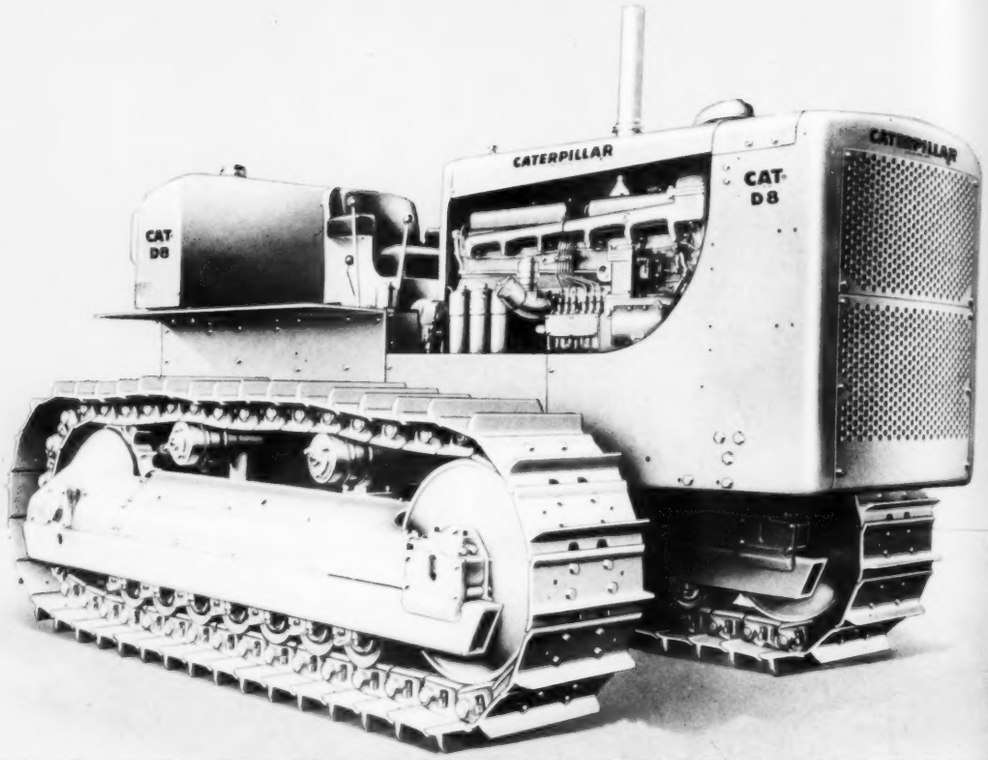
NEW

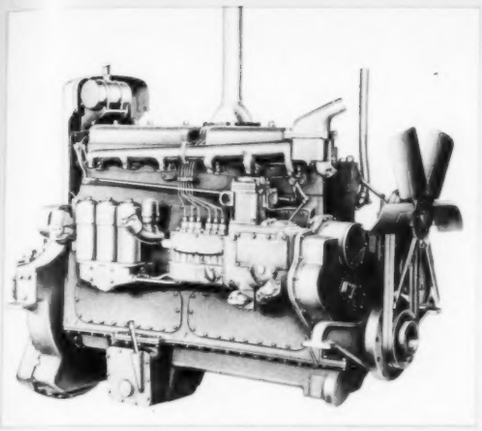
CATERPILLAR ANNOUNCES THE NEW D8

SERIES D and SERIES E

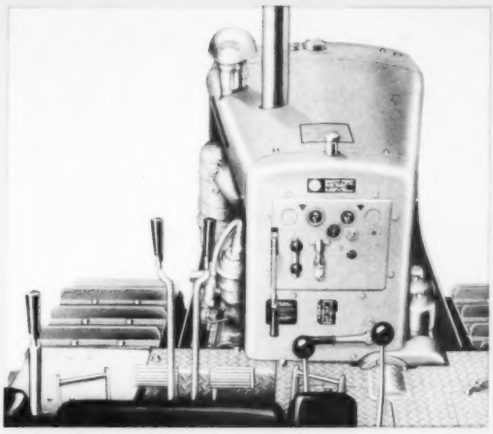


Choice of TORQUE CONVERTER or DIRECT DRIVE

You're looking at a major advance in tractor design—the new Caterpillar D8 Tractor. While it still bears the name of the unit that earned world-wide recognition as "boss of the crawlers," it is basically a *new* machine with 155 HP at the drawbar and your choice of torque converter (Series D) or direct drive (Series E). From its new 7-roller track frame to its new 191-HP, 1200-r.p.m. engine, it is built to deliver an even higher standard of money-making production on *any* track-type tractor application in *any* field. Along with its advance-design features, it retains such outstanding Caterpillar exclusives as the oil clutch and certain other job-proved developments. As a result, you can figure on it for *more* work at *lower* cost with *less* down time on *any* job. For complete information about the new, heavy-duty D8 Series D and Series E, see your nearby Caterpillar Dealer.

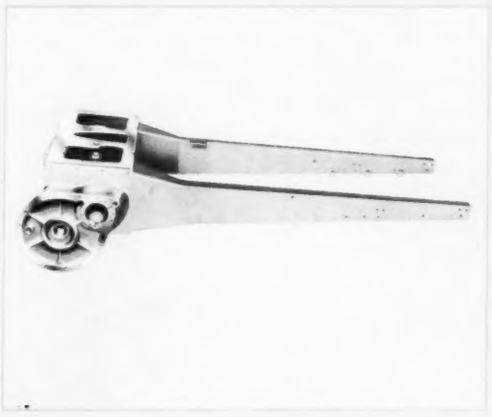


NEW ***ENGINE,*** with new fuel injection system incorporating capsule-type injection valves. Flanged center main bearing to take crankshaft thrust. "Hi-Electro" hardened timing gear integral with crankshaft.



NEW ***EASY-WORKING CONTROLS*** handy to comfortable, one-man seat. The new streamlined hood affords greater visibility. The new easy-to-see instrument panel is attached direct to engine.

NEW ***"LIVE SHAFT" DRIVE,*** independent of flywheel clutch. This important new feature provides constant power for rear-mounted cable controls or other equipment.



NEW ***WELDED ONE-PIECE STEERING CLUTCH CASE—*** main frame assembly for a stronger "backbone." Transmission and steering clutches can be removed without disturbing other parts.

NEW ***OPTIONAL DRIVE,*** torque converter or direct drive, whichever is best for your job. *Torque converter:* torque multiplication of 5 to 1 gives smooth operation in each speed range. 3 forward and 3 reverse: low 0 to 3.6 m.p.h.; intermediate 0 to 5.3 m.p.h.; high 0 to 7.4 m.p.h. *Direct drive:* 5 speeds forward and 3 reverse.

NEW ***7-ROLLER TRACK FRAME*** for greater stability, flotation and better ride.

NEW ***"WATER-QUENCHED" TRACK SHOES*** for longer life than ever before.

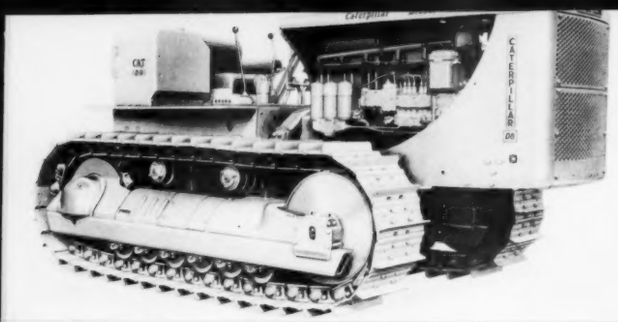
NEW ***HYDRAULIC BOOSTER STEERING,*** pump drive direct from engine, independent of flywheel clutch, for maximum steering ease.

NEW ***STARTING ENGINE*** with more power for faster, surer starts in any weather.

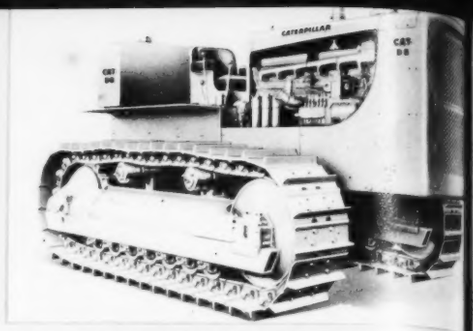
NEW ***"IN-SEAT" STARTING*** for greater convenience.

NEW ***118-GALLON FUEL TANK,*** enough for normal 12-hour operation.

NEW ***ATTACHMENTS*** include cable controls—the new rear-mounted double drum No. 29 with constant power drive direct from engine, and the new front single drum No. 30. New, larger No. 8A and No. 8S Bulldozers, both cable and hydraulic controlled, are also available. The new No. 8U "U"-blade 'dozer has extra strength. Cable-controlled 'dozers use a 6-part line for greater lifting power. All equipment used on the D8 can be used on the new D8 Series D and Series E.



The D8



The NEW D8 Series D and Series E

CHECK THE DIFFERENCE ADVANCE DESIGN MAKES BETWEEN THE D8 AND THE NEW D8 Series D and Series E

	D8	D8 Series D with torque converter	D8 Series E with direct drive
Operating Weight	38,155 lb.	41,265 lb.	40,430 lb.
Ground Clearance	10½ in.	13 in.	13 in.
No. Track Rollers	6	7	7
No. Track Shoes	39	42	42
Length of Track on Ground	99¾ in.	111¾ in.	111¾ in.
Area Ground Contact 22-in. Shoe	4389 sq. in.	4917 sq. in.	4917 sq. in.
Fuel Tank Capacity	98 gal.	118 gal.	118 gal.
Drawbar	Swinging	Fixed	Fixed
Drawbar Pin Size	1¾ in. dia.	2¼ in. dia.	2¼ in. dia.
Steering Clutch	Over center spring booster	Hydraulic booster	Hydraulic booster
Steering Clutch Case	Cast iron. Integral with transmission case.	Steel fabricated. Separate from transmission case.	Steel fabricated. Separate from transmission case.
Transmission Case	Cast iron. Integral with steering clutch case.	Cast iron barrel. Separate from steering clutch case.	Cast iron barrel. Separate from steering clutch case.
Main Frame	Box section bolted to cast case.	Box section welded to steel case.	Box section welded to steel case.

Production-wise and profit-wise, you have a new yardstick of performance in the CAT* D8 Series D and Series E. Your Caterpillar Dealer, source of prompt service, will be glad to show you how this rugged new yellow machine can pay off for you!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

MAIL TODAY!

CATERPILLAR TRACTOR CO., Peoria, Illinois, U. S. A.

Please send me additional information on the D8 Series D and Series E.

Name _____

Company _____

Street _____

City _____ *Zone* _____ *State* _____

CATERPILLAR*

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The new D8 Tractor —another example of CATERPILLAR LEADERSHIP in action

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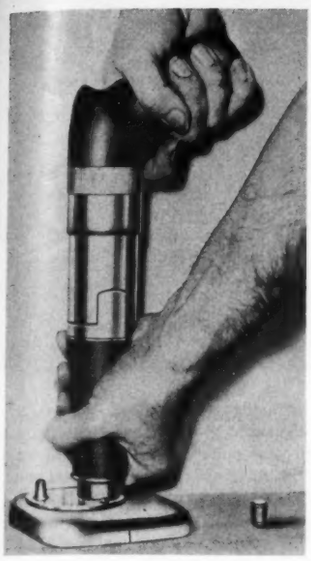


The new Creary Drive-It 330 tool weighs under six pounds, and is powered by 0.25 caliber cartridges.

Compact Pin-Driving Tool Is Powder Actuated

■ A new high-powered but lightweight powder-powered driving tool for use in all types of building, including heavy construction, is now available from Powder Power Tool Corp., 7527 S. W. Macadam Ave., Portland, Oreg. The Creary Drive-It 330 tool weighs less than six pounds, is only 13 inches long, but has a 0.25 caliber drive. Although adaptable also to a 0.38 caliber drive, it will handle nearly all jobs in its lighter caliber, according to the manufacturer.

The tool features a snap-open breach with automatic cartridge extractor. It has a molded-rubber pistol grip and foregrip, while the rest of the tool is made with a polished chromium finish. It field strips into three segments for complete cleaning.

The Model 330 driving tool uses 56 different sizes and kinds of drive pins and can be used on a large variety of jobs.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 736.

Impact Breaker Operates On Multi-Stage Principle

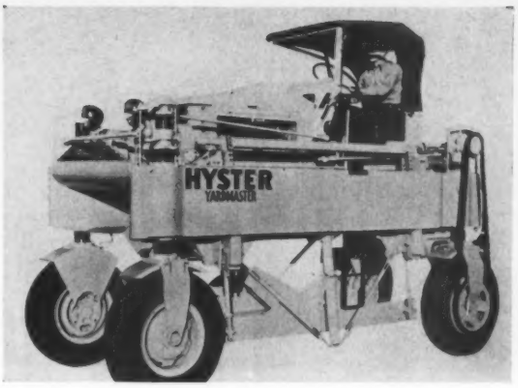
■ The heavy-duty Kennedy Model 3648 Cuber Senior impact breaker that provides primary and secondary crushing of nonabrasive stone in a single unit is shown in a new folder. The machine is described as a multi-stage triple-action breaker that operates on a new concept in impact breaking.

A diagram illustrates the crushing principle employed. Material entering at a low feed position progresses over two hammer-equipped rotors that smash it successively against the feed box deflector, an adjustable baffle, and the discharge grate.

The literature provides details on the operation and construction of the Cuber Senior and lists capacities and other specifications.

To obtain Bulletin D-3648 write to Kennedy Van Saun Mfg. & Engineering Corp., Danville, Pa., or use the Request Card at page 18. Circle No. 724.

THIS NEW HYSTER straddle truck has a 20,000-pound capacity, 2,000 pounds more than the previous comparable Hyster unit. Power has been increased from 82 to 91 horsepower with a Hercules Model JXE-3 L engine. Mechanical improvements include a 12-inch clutch, vacuum power brakes, and a heavy-duty hypoid differential. For further information write to Hyster Co., Portland 8, Oreg., or use the Request Card at page 18. Circle No. 754.



Same equipment—different jobs

Should you change wire rope constructions?

Under normal conditions there is one best size and type of Red-Strand rope for every wire rope using machine. This is the one you use day in and day out on your routine work.

But what about other conditions, the tough job, the unusual job? Suppose abrasion becomes a bigger factor, or unusual strength is needed, or more flexibility? Is a change of rope type in order?

Take a power shovel, for example. Moving dirt, sand, gravel, ore, it works fast handling smooth loads. If it is on a long job of clearing large rock, however, it will move slower and receive heavy jars and shocks. A different Red-Strand wire rope construction will probably absorb shocks better and last much longer than ordinary types.

Take *your* equipment for another example. Whatever your business and however you use wire rope—if unusual conditions arise call in your Leschen technical man. Leschen makes all types, knows the special advantages and qualities of every one, and can help you choose the rope that will do your job best—on shovels or any type of equipment. Leschen's Hercules Red-Strand wire rope is working profitably in every industry.

Your Leschen man can easily be reached through your nearby Leschen distributor. See him soon.

LESCHEN
HERCULES *Red-Strand*® WIRE ROPE

Depend on Leschen's higher-than-rated quality for longer-than-expected service.

LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.
St. Louis 12, Missouri

Hot-mix, dumped to the Barber - Greene finisher from a Diamond-T truck, is laid on one half of the road.

C&E Staff Photos

Asphaltic cement is heated and pumped to an Etnyre 4,000 - gallon transport trailer by a Cleaver-Brooks booster mounted on a Diamond-T truck.

Low-cost resurfacing job uses old blacktop as base

At a low cost of $12,900 per mile, old road-mixed surfacing was converted to base material and a new hot-mix bituminous surface laid last year on a stretch of U. S. 81 near Salem, S. Dak. This 19-mile job on the base and 24-foot-wide pavement, planned and supervised by the South Dakota State Highway Commission, was done under a $258,634.94 contract by C. H. Lien Construction Co., Inc., Rapid City, S. Dak.

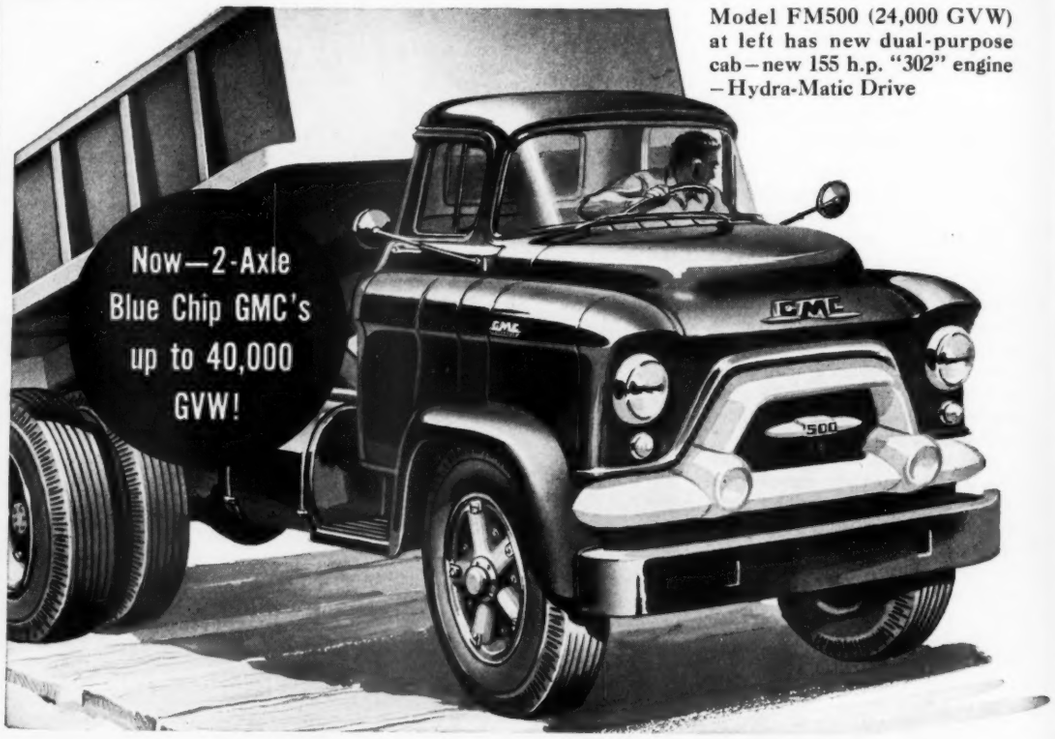
The old surfacing on the lightly traveled road was broken up and reduced to usable base material by a Hyster grid roller pulled by a Caterpillar D7 tractor—a combination which worked with a fleet of five Cat No. 12 motor graders. After the first pass by the roller, the graders turned the material over and spread it out while the roller prepared to make a second pass. When the material was sufficiently pulverized, it was watered, relaid, and compacted with pneumatic rollers. Where poor subgrade material was disclosed, it was removed to a depth of from 1 to 3 feet and replaced with granular backfill.

In addition to the old surfacing material, 4 to 8 inches of new base material was added to the roadbed. This was pit-run gravel crushed to 1¼-inch maximum size and stabilized with clay or rock dust. Base aggregate for the south half of the job was produced by a Cedarapids two-unit crusher in a pit near the right-of-way. An Austin-Western tandem crushing plant produced the remainder of the aggregate from another pit near the north end of the project.

Clay and Rock Dust Binders

Clay binder obtained from nearby borrow pits was spread on the roadbed and mixed by motor graders to stabilize the gravel for the north section of the project. On the south section, rock dust was hauled from a quarry at Spencer, S. Dak., and mixed on the road in the same manner. The mixed base material was laid out in 2-inch lifts by the motor graders and watered by four 3,000-gallon water-tank trailers pulled by International R-185 trucks. Seven Bros and Tampo pneumatic-tire 13-wheel rollers which compacted the base courses were pulled by Case and International tractors. Final compaction and finishing was done with Buffalo-Springfield and Galion steel-wheel rollers.

The finished base was primed with an application of MC-1 cutback asphalt at the rate of 0.4 gallon per square yard. The surface was then blotted with sand spread by a Buckeye chip spreader. Before the hot-mix surfacing was applied, the surface was swept by Rosco and Hough power brooms pulled by International tractors to remove dirt and excess sand. The base was then tacked with an



Model FM500 (24,000 GVW) at left has new dual-purpose cab—new 155 h.p. "302" engine—Hydra-Matic Drive

Now-Blue Chip GMC's

BLUE CHIP GMC TRUCKS

Today—GMC proudly presents the new generation of trucks—its new Blue Chip line. It offers the biggest selection of power-transmission-axle-chassis combinations ever engineered for construction work. You can choose from:

11 GREAT NEW ENGINES—6 power-hiked gasoline engines—3 improved *2-cycle* Diesels—span a 125 through 230 h.p. range. And GMC is introducing 2 great new V8's—rated at 155 and 175 h.p.

TRUCK HYDRA-MATIC* IN 5 SIZES—Now you can take advantage of Hydra-Matic economies on *any* job up to 46,000 GVW. 65 new Blue Chip GMC models have this built-in self-protection against truck-killing strains. And all heavy-duty manual-shift models have bigger clutches.

3 COMFORTABLE NEW CABS—There's wide-horizon visibility through new raked-back windshields on redesigned conventional cabs up through 46,000 GVW. There are 18 popular "Stripaway" c.o.e.'s. And GMC's new dual-purpose cab—blanketing the 16,000-29,000 GVW range—gives you a c.o.e.'s compactness with all the easy servicing and low step of a conventional truck.

HUNDREDS OF NEW FRAME AND AXLE COMBINATIONS—Frames on all models are up to 11% stronger. Stress-relieving

A Barber-Greene 848 continuous-mix asphalt plant turns out hot-mix for the job. Aggregates are dried and heated in a Cedarapids dryer, and asphaltic cement is pumped to the mixer from a 4,000-gallon transport.

The single surface course, more than 2 inches thick, is compacted by a Galion 8 to 12-ton tandem roller.

application of RC-1 cutback asphalt at a rate of 0.08 gallon per square yard. Bituminous materials were applied by two distributors, a 1,500-gallon Standard mounted on a Ford F-7 truck and 1,000-gallon Etnyre on a Diamond-T 509 truck.

Hot-mix bituminous surfacing was applied in a single course more than 2 inches thick by a Barber-Greene finisher and compacted by Buffalo-Springfield and Galion 8 to 12-ton tandem rollers. The normal procedure was to lay a strip 12 feet wide over half of the roadway for a full day's run. At night the finisher was brought back to the starting point and the other half was laid the next day. Although this meant working with a cold center joint, there was no time lost moving during the day.

After the mat had been laid, the surface was given a flush seal of RC-1 cutback asphalt applied by the distributors at the rate of 0.08 gallon per square yard. This was immediately blotted with a light application of sand to prevent its being picked up by tires.

Hot-Mix Plant

The plant which produced the bituminous surfacing material was set up at the gravel pit near the south end of the job. Pit-run gravel was crushed to minus ¾-inch size, and a small amount of rock dust was added to make the aggregate for the mix. This material was produced by the same Cedarapids plant which produced the base material. A large stockpile was built at the plant site and a Caterpiller D7 tractor with dozer pushed the aggregate to a trap which fed the bucket elevator leading to the dryer.

Principal units of the plant were a Cedarapids dryer driven by a General Motors diesel engine and a Barber-Greene 848 mixing unit and hot elevator.

Asphalt cement of 100 to 120-penetration grade was unloaded from tank cars at Salem and trucked to the plant by four 4,000-gallon insulated transports pulled by International and Diamond-T trucks. Material in the tank cars was first heated by Cleaver-Brooks and Littleford Bros. tank car heaters and then pumped into the transports by two Cleaver-Brooks boosters. The asphalt was pumped directly from the transport tanks to the mixer at the plant.

All of the transports were equipped with internal steam coils for heating the asphalt, and steam for this purpose was furnished by a Cleaver-Brooks 125-hp oil-fired boiler. No. 2 fuel oil for this boiler and No. 6 oil for the dryer were stored in two 9,000-gallon tanks at the plant site.

To haul from the plant to the road, Lien used his own fleet of 16 Diamond-T 323 and International R-165 dump trucks. Additional trucks needed for long hauls were rented from local operators. Although the aggregates were quite wet, production from the plant averaged close to 1,200 tons per day.

Shouldering

Gravel shoulders 2 feet wide and the thickness of the mat were built on each side of the 24-foot pavement. Gravel was loaded from stockpiles to

Model MW630-50 (46,000 GVW) pictured at right is Hydra-Matic equipped – has power-hiked 225 h.p. gasoline engine

in the widest choice of trucks ever offered the construction field

reinforcements for severe service are now *factory-installed*** – right on the production lines. There are six-wheelers and ten-wheelers in all weight classes. And there are larger capacity axles – front and rear – on most GMC's.

MANY EXTRA PAYLOAD AND MANEUVERABILITY FEATURES – Better weight distribution gives extra payload capacity throughout the line. Turning radii are shorter – especially on dual-purpose cab models with their set-back front axles. And Safety Power Steering** is optional on all Blue Chip GMC's from 2 tons up.

* * *

And prices? Competitive trucks can't touch these Blue Chip values. See your GMC dealer – and see for yourself!

**Hydra-Matic standard on many GMC models; optional at extra cost on some others*

***Optional at extra cost*

BLUE CHIP GMC TRUCKS

Your Key to Blue Chip Value!

GMC TRUCK & COACH – *A General Motors Division*

a fleet of dump trucks by a Kolman conveyor belt. As the trucks moved along on the pavement, a Power Pack side-delivery conveyor placed the material in the shoulder. It was then bladed to shape and compacted with pneumatic rollers. Shoulders were primed with an application of SC-4 road oil applied at a rate of 0.5 gallon per square yard. Shoulder aggregate was weighed on a 30-ton Thurman truck scale.

Personnel

Superintendent Henry Kaiser ran the job for C. H. Lien Construction Co., Inc. Resident engineer for the South Dakota State Highway Commission was Everett Moore. R. K. Morrell is construction engineer, and H. C. Rempfer, state highway engineer, for the South Dakota Commission. THE END

Additives Improve Bond Of Asphalt to Aggregate

■ At the annual meeting of the Association of Asphalt Paving Technologists held recently at New Orleans, La., Dr. C. F. Huber and P. F. Thompson, chemists for Carlisle Chemical Works, Inc., Reading, Ohio, presented a paper on the function and chemistry of asphalt additives.

The study concluded, briefly, that the coating of aggregate by asphalt is a surface phenomenon which can be aided by the use of surface-active agents. That is, a stronger and more stable bond can be formed between the asphalt and the aggregate by the use of additives. In addition, by proper chemical design of the molecular structure, effective surface-active agents can be made which will maintain their effectiveness under all adverse conditions.

It was pointed out that these principles apply whether the aggregate is wet or dry and whether an asphalt cement or cut-back is used.

Data on Cold-Applied Paving-Joint Sealer

■ The characteristics of Presstite No. 77 joint-sealing material are described in some detail in a new folder from Presstite Engineering Co., 3796 Chouteau Ave., St. Louis 10, Mo. The cold-applied paving joint sealer has been used extensively in construction of the Ohio Turnpike.

Presstite No. 77 is a cold-applied rubber-base asphaltic sealer that is reported to remain tough and elastic in subzero weather and at temperatures as high as 140 degrees. The material is easily pumped under pressure with a heavy-duty air pump, hose, and nozzle directly from a drum without heating.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 602.

Rust Assigns McCoy To Executive Position

The Rust Engineering Co., Pittsburgh, Pa., has appointed C. Dana McCoy New York manager and international director of the firm. Formerly associated with the Foster Wheeler Corp., New York, N. Y., Mr. McCoy is active in engineering associations both in this country and in South America.

He will make his headquarters at the company's New York City office.

Florida Office for Goodall

A Goodall Rubber Co. branch office and warehouse was opened last month in Stuart, Fla., for maintaining stocks of contractors' and marine rubber products.

Earl J. Ricou is manager of the new branch office for the Trenton, N. J., firm.

Triplex Backfill Tamper

■ A new Davey Triplex backfill tamper has three Davey Model DT-32 tampers mounted on a single frame. The tampers are of the medium-weight class, each weighing 35 pounds. With the Triplex mounting, the complete tool weighs 147 pounds.

Each of the three Davey tampers has a 1½-inch bore and 6-inch stroke. It is 46¾ inches long and has a maximum body diameter of 3 inches. Butt diameter is 5⅞ inches. Average air consumption per breaker is 32 cfm at 85 pounds pressure. The Triplex tamper can be easily operated by a 105-cfm compressor.

The new Davey Triplex tamper operating from a 105-cfm compressor.

For further information write to the Rock Drill Division, Davey Compressor Co., Kent, Ohio, or use the Request Card at page 18. Circle No. 755.

THEY'RE HERE! NEW CHEVROLET

New models . . . more models . . . higher G.V.W. Designed and built the way you can count on Chevrolet, the leader, to build them. Ready to do more jobs. Do 'em faster. Do 'em better. And do 'em with new economy.

Dressed for a new bonus

For the first time in any truck line, *two* distinctly different styling treatments are offered by Chevrolet. One in light and medium models, another in heavy-duty. Each is a new, profitable advertisement-on-wheels for you and your business.

Measured for a new savings

Makes a whale of a difference to get a truck that fits the job. And in Chevrolet you get it! With 75 different models, all having the industry-standard 34-inch frame width . . . 15 wheelbases, ranging to 220 inches . . . three different chassis types, conventional, forward control, low cab forward . . . and with maximum G.V.W.'s upped to 18,000 lbs.—Chevrolet's new line of Task-Force Trucks offer the *exact* truck to do the job you

THEY'RE HERE! NEW CHEVROLET

Self-Propelled Rubber-Tire Rollers Feature Segmented Construction and Front-Wheel Drive

Segmented design of this new front-wheel-drive BMCO self-propelled roller gives it added traction and maneuverability.

■ Front-wheel drive and a newly developed segmented design give two new BMCO self-propelled pneumatic-tire rollers exceptional maneuverability. The rollers are designed with the engine, transmission, and operating controls grouped with the front wheels in a fore section that turns independently of the ballast section. With power on all front wheels and hydraulic steering, the rollers can make comparatively short turns without skidding—even in loose materials.

A short wheelbase design contributes to the maneuverability of the new BMCO rollers. Both the 9-wheel PR-9 with a 9-foot wheelbase and the 13-wheel PR-13 with a 10-foot wheelbase turn in a radius of 15 feet.

The position of the engine and transmission, which are mounted entirely clear of the ballast box, also increases the volume of ballast that the rollers can carry. The PR-9 holds up to 100 cubic feet and the PR-13 has a ballast capacity of 125 cubic feet. This gives the rollers maximum weights of 18,000 and 26,000 pounds, respectively, with the weight distributed over a 66-inch rolling width in the smaller model and over a 95-inch width in the larger unit.

There is sufficient tire overlap to eliminate ridging. The rollers have fully oscillating rear wheels, while the front wheels oscillate about the yoke center pin. Other construction features include the use of a heavy 4¼-inch-diameter king pin mounted in Timken tapered roller bearings, enclosed chain drives, and simplicity of design for easy maintenance. Both units have openings in the ballast box for removal of ballast.

Hydraulic brakes and a manual parking brake provide close control and add to safety in operation. A water-sprinkler system is optional.

Power for the PR-9 comes from a Ford engine developing 52.5 bhp at 2,000 rpm. The engine in the PR-13, also a Ford, delivers 74 bhp at 2,000 rpm. Ford transmissions and differentials provide both units with forward speeds of 3.4, 6.8, and 13.6 mph and a reverse speed of 3 mph.

For further information write direct to Browning Mfg. Co., 111 Humble Ave., San Antonio 6, Texas, or use the Request Card at page 18. Circle No. 702.

Task-Force TRUCKS CHEVROLET

need done . . . with operating costs lower than ever!

There's new Overdrive for even bigger gas savings on ½-ton models . . . proved truck Hydra-Matic on ½-, ¾- and 1-ton models—each optional at extra cost. And now, as standard equipment, Power Brakes are featured on 2-ton models (optional on all others) and Tubeless Tires are standard on ½-ton models.

Powered for economy

Whether you deliver door-to-door or haul state-to-state, Chevrolet's *six* new "high-voltage" engines offer the right power-combination for dependable, economical performance on every job. All are of efficient valve-in-head design with high compression ratios. All feature the surer kick-off and bigger generator capacity that only Chevrolet's new 12-volt electrical system delivers.

Chevrolet's new "under-the-hood" features are almost endless. Engine mountings are completely redesigned, cooling and lubricating systems made more efficient, fuel system improved . . . on and on they go, setting a new pattern for the truck industry.

Investigate without delay

So revolutionary are the many new and profitable features advanced by Chevrolet's new Task-Force that truck users everywhere should see their Chevrolet dealer today. Learn the complete story and get started on your way to better trucking. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

Task-Force TRUCKS CHEVROLET

High-Strength Wire Rope

■ New literature is available on a recently developed wire rope that is stronger than improved plow steel cable. Reported to be at least 15 per cent stronger than the best grade of wire rope available up to now, the VHS wire rope has an average tensile strength of 300,000 psi.

The preformed rope is available in sizes from ½ to 2½ inches. The literature lists specifications and describes the use of the new wire rope in many construction applications.

To obtain this literature write to American Chain & Cable Co., Inc., 929 Connecticut Ave., Bridgeport 2, Conn., or use the Request Card at page 18. Circle No. 688.

Universal Atlas Appoints

Universal Atlas Cement Co., New York, N. Y., subsidiary of United States Steel Co., has appointed Clayton L. Davis technical service director.

Joining Universal Atlas in 1930 as engineer of the inspection bureau, Mr. Davis became assistant engineer of tests and, in 1943, was promoted to the post of engineer of tests. He has been active in the American Society for Testing Materials and is a member of the American Concrete Institute.

NAMES IN THE NEWS

Secretary of highways for the state of Pennsylvania, Joseph J. Lawler.

Lawler Is Pennsylvania's Secretary of Highways

Joseph J. Lawler, successor of the retiring E. L. Schmidt as secretary of highways for Pennsylvania, has a total of 19 years' experience in federal and state government administration. Mr. Lawler, appointed to the post by Governor George M. Leader, dates his first state experience in 1936. At that time, he served as chief of the endorsement division of the Bureau of Motor Transportation of the Public Utility Commission.

In 1942, Mr. Lawler was special inheritance-tax appraiser in the Auditor General's Department. Between 1942 and 1945, Mr. Lawler served in the armed forces. Once out of service, he served as assistant Postmaster General in charge of the Bureau of Finance until 1949, when he became first assistant Postmaster General with the Bureau of Postal Operation. He became Director of Internal Revenue in Scranton in 1952, and one year later, president of the Lawler Petroleum Co., Scranton, Pa.

The new secretary of highways, 53, was born at Jessup, Pa., and was graduated with an LLB degree from Catholic University of America in Washington, D. C. He received an AB degree from the University of Scranton and an honorary Doctor of Laws degree from Duquesne University.

Louis C. Schilling Heads Ready-Mix Concrete Group

New officers of the National Ready Mixed Concrete Association, headed by Louis C. Schilling of the I. E. Schilling Co., Miami, Fla., as president, have taken office for the ensuing year. They were elected at the 25th annual convention in Miami.

Other officers are Robert Mitchell of Consolidated Rock Products Co., Los Angeles, Calif., and John W. Roberts of Southern Materials Co., Inc., Richmond, Va., vice presidents, and M. Eugene Sundt of the Albuquerque Gravel Products Co., Albuquerque, N. Mex., treasurer. Robert C. Collins of the Warner Co., Philadelphia, Pa., is retiring president.

Forty others, of which four are members of the executive committee, comprise the board of directors.

Gunn Opens New Office As Consulting Engineer

Errett F. Gunn, formerly chief of construction for the U. S. Army Corps of Engineers, Savannah District, has opened consulting engineering offices at 1127 Washington Ave., Savannah, Ga. Mr. Gunn is offering his services for work on airports, recreation facilities, subgrade and pavement design, highways, streets, bridges, utilities, and building-construction supervision, and management studies.

BTEA Re-Elects Drew As 1955 President

The Building Trades Employers' Association, an organization of 1,000 building contractors in metropolitan New York, re-elected William B. F. Drew president at the annual meeting. Mr. Drew, secretary-treasurer of J. L. Murphy, Inc., New York, N. Y., general piping contractor, is a professional engineer and a member of the American Society of Mechanical Engineers and the American Society of Sanitary Engineers. A graduate of Stevens Institute of Technology, he has been with the Murphy organization for 34 years.

Re-elected first, second, and third

Turner Names Director

N. B. O'Connell has been elected a director of the Turner Construction Co., New York, N. Y. A vice president of the firm since 1952, Mr. O'Connell has been associated with Turner since 1920.

NEW BUCKEYE 403 A ladder-type ditcher designed specifically for foundation and service connection work. Small and easy to transport . . . Cuts squared corners and leaves no crumbs in the ditch . . . Crawler mounted for low ground bearing pressure and all-weather performance . . . Full range of bucket widths, 8″ to 16″ . . . Cuts to 5′ depth. Can handle the toughest digging.

NEW BUCKEYE 315 Heavy-duty utility and pipeline ditcher that digs from 24″ to 40″ widths and to a depth of 6′... Powerful, heavy and rugged, the 315 has set amazing performance records on tough jobs. The photo above shows it quickly and easily digging through solid coral rock . . . Ideal for pipelines, gas and water mains, cables, sewers, ditches and other heavy work.

SPECIAL BUCKEYE 306 A special application for digging trench for roadside drainage where narrow shoulders and sloping banks prevent standard ditchers from operating. Offset digging wheel can dig trench in line with outside edge of crawlers. Used on Ohio Turnpike.

BUCKEYE HI-WAY WIDENER Digs up to a mile per day of clean, flat bottom ditch—uniform in width and depth and ready to receive material. Can remove broken concrete . . . Travels up to 20 m.p.h. under own power. The low cost method of handling side ditch problems.

William B. F. Drew, president of the Building Trades Employers' Association.

vice presidents, respectively, were Joseph A. Courter, Courter & Co., Inc.; William N. Angus, William Angus Inc.; and Eugene McGovern, Cauldwell-Wingate Co. Jack W. Zucker, Shatz Painting Co., was reelected treasurer and W. Arthur Riehl, secretary.

Howard Joins WRI As Field Engineer

Edward M. Howard, former district engineer for the Asphalt Institute, has been made a field engineer of the Wire Reinforcement Institute, Washington, D. C. He will work out of Springfield Ill., coordinating institute activities with state and city projects using fabric-reinforced asphaltic concrete. In addition to consulting and promotion work, Mr. Howard will conduct discussions and presentations about the fabric-in-asphalt process before highway engineers and builders.

The newly appointed field engineer for the Wire Reinforcement Institute, Edward M. Howard.

An M. I. T. graduate in civil engineering, Mr. Howard began his career as a rodman in Danbury, Conn. He was a resident engineer for the Illinois Division of Highways from 1921 to 1926, and an independent consulting engineer in the street and highway field from 1926 to 1942. After serving as a commander in the Seebees during World War II, he joined the Asphalt Institute as a district engineer in Boston, Mass.

He holds membership in the Highway Research Board, Association of Asphalt Paving Technologists, Society of Military Engineers, and the honorary engineering society, Theta Tau.

Raymond Picks Krueger For New Executive Post

Six executives have been promoted in elections and appointments announced by the Raymond Concrete Pile Co., New York, N. Y. One of the six, Myron W. Krueger, has been elected to the newly created post of executive vice president.

Myron W. Krueger, recently elected the first executive vice president of Raymond Concrete Pile Co.

Donald W. Moss, James Pinnell, and Herbert M. Crowley also were elected vice presidents, and James P. Cummins and Gordon F. A. Fletcher were named assistant vice presidents.

Mr. Krueger joined the company in 1948 as treasurer, and was elected a vice president in 1952. While discharging his new duties, he will continue as treasurer.

Mr. Moss will direct domestic sales, Mr. Pinnell will have charge of domestic construction work, and Mr. Crowley will be in charge of central planning. Mr. Cummins will direct sales activities in the eastern zone, and Mr. Fletcher will manage the boring division.

Moles Give Annual Awards To Jansen and Walsh

The Moles' annual awards, won this year by Carl B. Jansen, president of the Dravo Corp., Pittsburgh, Pa., and Thomas J. Walsh, chairman of the Walsh Construction Co., New York, N. Y., were presented to the two men at the organization's dinner in the Waldorf-Astoria Hotel in New York City. The awards are presented annually by the tunneling and heavy-construction society to a member and nonmember for their contributions to the industry.

Mr. Jansen, nonmember winner, was presented his award by A. Holmes Crimmins, first vice president of the organization. Adm. Ben Moreell, a 1943 award winner, made the presentation to Mr. Walsh.

More than 1,000 persons attended the affair, at which Dr. Richard L. Hearn, chairman of the Hydroelectric Power Commission of Ontario, Canada, was the principal speaker.

Mr. Jansen, with Dravo since 1922, has worked on such projects as the East Bay crossing of San Francisco Bay bridge and a section of the Delaware River Aqueduct. Under the Walsh Construction Co. banner, construction was done on the Queens-Midtown tunnel in New York City. The firm is now working on 26 miles of tunnels from the Catskill Mountains to New York City.

GAR WOOD-BUCKEYE DITCHERS

LATEST DEVELOPMENTS IN DITCHERS

Over and over again comparative costs have proved to contractors that there is no such thing as economical 'all-purpose' equipment . . . If specialized jobs are to be done at lowest possible cost, specialized machines must handle it—and no machine handles a ditching job better than a Buckeye Ditcher!

For over 50 years Buckeye has pioneered in the development of specialized equipment to dig ditches faster, better and at lowest possible cost . . . Although known and used in every part of the world, Buckeye engineering is never static—constant improvement and continuous advancement is the price of leadership.

The latest developments in the Buckeye line are illustrated and described on the page at left—but these new machines are but a small part of the *complete* Buckeye line . . . From the huge ''51', used on the biggest pipeline jobs, to a small machine for farm drainage work, Buckeye makes a machine for every possible ditching job! . . . Wheel type or ladder type—for wide cuts or narrow cuts—deep cuts or shallow cuts—there's a Buckeye that is designed to do the job exactly right, and at the least possible cost in the minimum amount of time.

Your dealer will gladly give you detailed information on the entire line—and show you how specialized equipment can pay off on faster, cleaner, more profitable ditching!

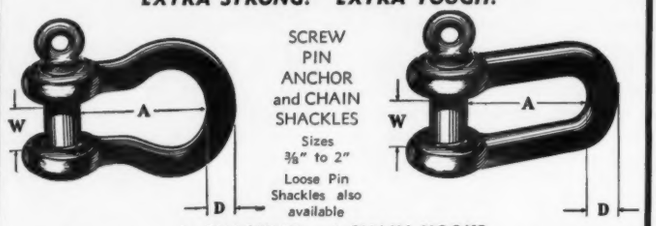
MODERN EQUIPMENT BUILT TO SOLVE MODERN PROBLEMS!

GAR WOOD INDUSTRIES, INC.
WAYNE, MICHIGAN

No. 522

BIG ORANGE *Hi-Strength* PRODUCTS

EXTRA STRONG! EXTRA TOUGH!



In SHACKLES and CHAIN HOOKS it is STRENGTH that Counts BIG ORANGE HAS IT!

Shackle Hooks Can Be Used on "HIGH TEST" Chain

Grab Hooks Available for Chain Sizes 1/4", 5/16", 3/8", 7/16", 1/2"

SLIP HOOKS for Chain Sizes 1/4", 5/16", 3/8"

Ask your Distributor or Write

MIDLAND INDUSTRIES, INC.

CEDAR RAPIDS, IOWA

RECIPE FOR BETTER AIR LINES

When you combine these advantages built into Naylor lightweight pipe, you can count on top performance in air lines for high or low-pressure service:

LIGHTWEIGHT—without sacrifice of strength, assures easy handling and installation.

SAFETY—through the spiralwelded lockseam which acts as a continuous expansion joint to absorb shock loads, stresses and strains.

GREATER COLLAPSE STRENGTH—through the reinforcing spiral truss which permits lines to be operated under vacuum as well as pressure.

FASTER CONNECTIONS—with the one-piece Naylor Wedge-Lock coupling that can be assembled or disassembled with a hammer.

For the complete story on this distinctive lightweight pipe and coupling combination, write for Bulletins No. 507 and No. 514.

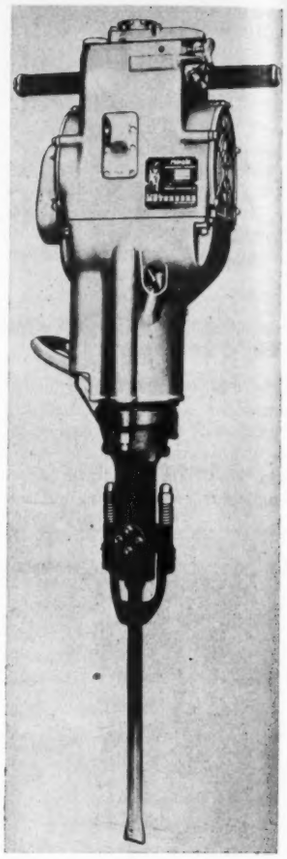
NAYLOR PIPE

NAYLOR PIPE COMPANY

1270 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York

Rock Drill and Breaker With Built-In Engine Is Carried on Shoulder To Operate Anywhere



■ A portable gasoline-driven rock drill that converts into a rock breaker has been imported from Sweden by Stanco Mfg. & Sales Co., 1931 Pontius St., Los Angeles 25, Calif. Powered by a single-cylinder two-stroke built-in engine, the Pionjar rock driller-breaker weighs only 86 pounds and can be carried into the field on the worker's shoulder. The engine has a floatless carburetor which makes it possible to drill at any angle, including horizontal and 45 degrees above horizontal.

Drilling speed of the unit is about 16 inches per minute with a 1.06-inch-diameter bit in medium-hard granite, and about 10 inches per minute with a 1.34-inch bit. Maximum drilling depth is 13 feet. A continuous blower cleans the hole as the machine bores.

Special hollow-drill steels are available for the Pionjar unit. These tungsten-carbide intraset steels are offered with plain or collared shanks in all bit diameters and lengths.

For further information write to the company, or use the Request Card at page 18. Circle No. 650.

Weighing 86 pounds, the self-powered Pionjar rock drill and breaker can be used on jobs in inaccessible locations.

Improved Lubricant For Diesel Engines

■ An improved crankcase lubricant developed especially for certain supercharged diesel engines has been announced by D-A Lubricant Co., Inc., Indianapolis 23, Ind. The new D-A Extra-Treated diesel oil has been qualified as a Caterpillar Superior Lubricant Series 2.

The lubricant uses a new type of additive which has increased the detergency reserve approximately three times, according to the manufacturer.

For further information write to the company, or use the Request Card at page 18. Circle No. 657.

Goodyear Plant Promotes

The assistant manager of molded and extruded goods sales at the St. Mary's, Ohio, plant of the Goodyear Tire & Rubber Co. is Eugene Caillet.

Mr. Caillet, a mechanical engineer, joined the Goodyear organization in 1948 as a sales engineer.

Dr. Kenneth W. Scott has been appointed to the physics and electronics section of the company's research division.

New! AUDIO HAILER

TESTED AND APPROVED BY ENGINEERS AND CONTRACTORS!

WORLD'S MOST POWERFUL ALL-IN-ONE POWER MEGAPHONE

- **ONE *Self-contained* UNIT...NO CABLES! LIGHTWEIGHT...ONE-HAND OPERATION.**
- **16 TIMES MORE POWERFUL THAN ANY OTHER PORTABLE POWER MEGAPHONE!**
- **EXCLUSIVE! VACUUM-TUBE AMPLIFICATION.**
- **LONG BATTERY LIFE: OVER 5,000 TEN-SECOND MESSAGES!**

FREE Literature.
DEALER INQUIRIES INVITED

AUDIO HAILER

AUDIO EQUIPMENT CO., INC.—GREAT NECK, N. Y.

The new Symons wide-panel concrete form.

Wide Panel Form for Low-Wall Construction

■ Wide panel forms for low-wall and grade-beam construction have been developed by Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago, Ill. The new forms are available in lengths of six and eight feet and widths of 30, 36, 42, and 48 inches.

Specially designed steel struts that allow ties to pass through the face of the panels permit both the inside and outside forms to be set up simultaneously. The ties can be broken back within the wall, simplifying stripping procedure.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 648.

Booklet Lists Advantages and Lubricating Qualities Of Greases Made with Non-Soap Gelling Agent

■ The characteristics of greases compounded with Bentone 34, a non-soap gelling agent, are described in a new booklet from Baroid Sales Division of the National Lead Co., 2404 Danville, Houston 1, Texas. The literature states that while Bentone greases are generally similar to soap-base greases in that they consist of gelled oil, they are superior in several respects.

Bentone greases are reported to be less subject to change in consistency with changes in temperature, and in fact, will not melt at any temperature. They are also very resistant to the washing action of water and are said to offer good adhesion to metal.

Other advantages discussed include the unusual mechanical and chemical stability of such greases and their ability to retain their characteristics over long storage periods.

The booklet also includes technical information on the chemical and physical properties of Bentone 34 gelling agent and describes the manufacture of Bentone greases.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 658.

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Send the coupon today for your copy of our new catalog showing the wide range of application as well as the many exclusive features that make the *Acker All-Purpose Digger* the most versatile and useful you can buy!

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14 Yard and Over Tandem Axle for Single or Tandem Axle Trucks.

Built to job specifications, single or tandem axles. Conforms with state highway laws in capacities from 10 to 20 yards and over. Light-weight, high tensile steel construction. All bracing external; load area clear. Mechanically operated hopper doors standard. Air-actuated trips, or hydraulic controls for both opening and closing also available. All trip mechanisms metered to control flow of materials. Hopper doors built to stand bucket loading. Because contractor's equipment must be kept running, these trailers are designed to be repaired locally, eliminating delays due to waiting for parts. Any mechanic can service or repair. Write now for full information and address of your nearest distributor.

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Compacting sub-base on the Ohio Turnpike.

DO IT FASTER — BETTER and CHEAPER with the *JACKSON* VIBRATORY COMPACTOR!

MACADAM CONSTRUCTION: All around the country on major paving projects the JACKSON VIBRATORY COMPACTOR is being hailed as the most advantageous equipment ever developed for achieving specified density in rock, slag, soil-bound macadam, gravel and sand base courses. Uniform compaction to final density is obtained in rock macadam courses up to 12" in minimum time. The dry fines are quickly vibrated into all voids, filling them chockfull, solidly, from top to bottom of the course. Standard width is 13',3". Working speeds up to 60 FPM, reverse travel: 5½ MPH.

SUB-BASES, GRANULAR SOIL-CEMENT PAVING and SAND FILLS: It is equally efficient on gravel sub-bases and granular soil-cement paving or base course construction. And it's a bear-cat for compacting sand fills such as bridge approaches, since it quickly achieves desired density and individual units may be subtracted and even fitted with operating handles to suit every condition and to get into the really tight places.

PAVEMENT WIDENING: In any granular material used in flexible base course widening specified density is accomplished in one pass with the compacting units towed in tandem at the side of the tractor. Interchangeable bases from 12" to 26" wide may be substituted for standard 26" bases to suit requirements.

By all means investigate this time and money saving equipment

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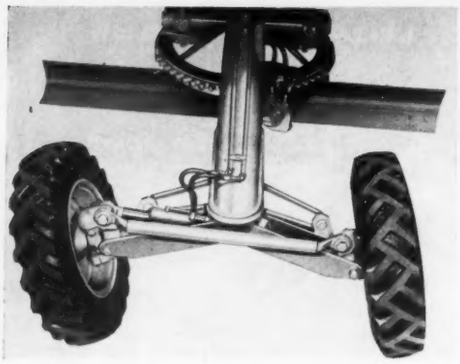


The optional front-wheel-lean assembly of the Allis-Chalmers Model D motor grader has been improved. Better control and fewer wear points are two of the advantages reported for the new design.

Grader Gets Improved Front-Wheel-Lean Design

■ Design changes in the Allis-Chalmers Model D motor grader have reduced the number of wear points on the leaning front-wheel assembly and the grader's steering mechanism. Shim adjustments are now used to take up knuckle wear, and bushings have been replaced by tapered and roller bearings.

A further advantage is the improved control over the leaning operations. This has resulted from reducing the travel speed of the leaning front wheels and adding further strength to the tie rods.

For further information write to Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 751.

New Air-Entraining Agent

■ A new air-entraining agent for concrete has been announced by the Permite Concrete Curing Compound Division, Aluminum Industries, Inc., 2438 Beekman St., Cincinnati 25, Ohio. A clear amber low-viscosity liquid, Permite N-tair is a homogeneous solution that is reported not to segregate, settle out, become gummy, or lose efficiency even during storage in the field under adverse conditions. The agent is available in both single and double-strength solutions.

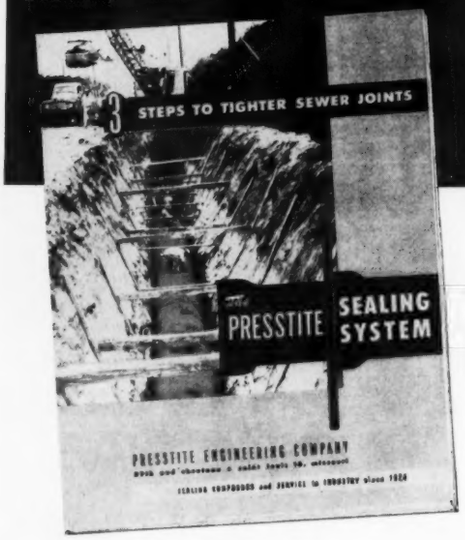
The compound is added at the time of the concrete mixing. Between ¾ and 1 ounce of Permite N-Tair is added to the mixing water for each sack of cement to obtain 3 to 6 per cent volume of entrained air in the mix. According to the manufacturer, the new product meets all essential specifications and is accepted by ASTM, Bureau of Public Roads, Corps of Engineers, and all other federal and state departments.

The product is packaged in 5-gallon pails and 30 and 53-gallon drums.

For further information write to the company, or use the Request Card at page 18. Circle No. 642.

let this free book show you . . .

HOW to get tighter sewer joints



You can meet the lowest infiltration requirements. This free book gives you the answers!

WHAT Presstite's famous 3-step sewer joint sealing system is.

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Please send me my free copy of the new Presstite book *3 Steps to Tighter Sewer Joints.*

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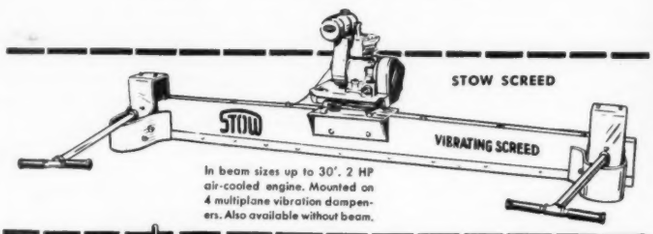
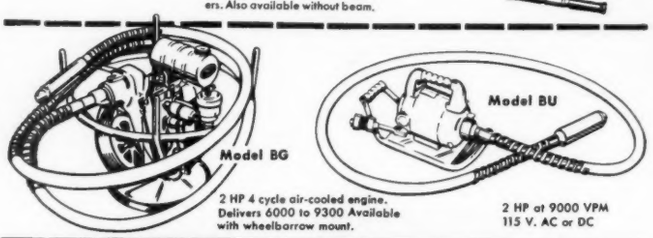
Concrete facts about Concrete Vibrators and Screeds

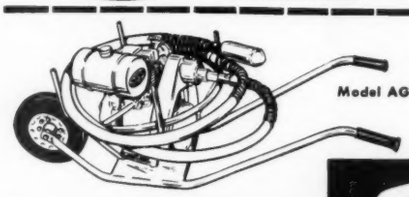


In beam sizes up to 30'. 2 HP air-cooled engine. Mounted on 4 multiplane vibration dampeners. Also available without beam.



2 HP 4 cycle air-cooled engine. Delivers 6000 to 9300 Available with wheelbarrow mount.

2 HP at 9000 VPM 115 V. AC or DC



4½ HP 4 cycle air-cooled engine. Mounted on wheelbarrow for easy maneuverability. Delivers 6000-9300. Available without wheelbarrow.

Here is the name you want!

STOW

The high operating speeds of the new STOW line of Concrete Vibrators make possible the use of heavy duty, light weight flexible shafting and lighter, more efficient vibrator heads—which speed operations, cut costs. And, STOW design provides convenient, practical speed control so *attachments may be used directly on the vibrator shafts.*

STOW SCREEDS—permit placing more than 300 cu. yds. in less than 8 hours; strike off and impact in one operation; leave surfaces true to grade; work up to and around manhole covers and obstructions.

See your STOW distributor about STOW vibrators and screeds today. Send for free Catalog 552

STOW MANUFACTURING COMPANY
40 Shear Street Binghamton, New York

The Teale scarifier attachment.

Scarifier Attachment Rips Hard Surfaces

■ A new hydraulic scarifier from Teale & Co., rips hard-packed surfaces including rocky or frozen soil, clay, macadam, or shale. The attachment is available in four models with from 6 to 8 teeth and with ripping widths of 5 to 7 feet. The unit is made to fit Caterpillar D2 and D4, Allis-Chalmers HD-5, International Harvester TD-6 and TD-9, and Oliver A and B tractors.

An important design feature of the Teale scarifier is that it attaches to the drawbar of tractors to derive its pull directly from the frame, rather than from the transmission housing. A carriage of all-welded box construction and teeth made of special grader-blade steel are other features.

Twin cylinders adjust ripping depth to a 9-inch maximum penetration. The scarifier is shipped with the twin cylinders, hydraulic tubing, and a selector valve to work with any specified hydraulic system.

For further information write to Teal & Co., 1415 N. 52nd St., Omaha 2, Nebr., or use the Request Card at page 18. Circle No. 605.

Clark Plant Manager

Managing the 150,000-square-foot Pipestone Road plant of Clark Equipment Co. at Benton Harbor, Mich., is Phillip Hoel. The new plant was designed specifically for the manufacture of Clark's line of Michigan tractor shovels and excavator cranes. Until last year, Mr. Hoel was with the R. G. LeTourneau Co.

Scenes like THIS are helping reduce insurance costs on jobs like THIS

Construction view, Folsom Dam, American River, California. Merritt-Chapman & Scott, and Savin Construction Co., both use AJAX Cups and drinking water equipment on this multi-million dollar project.

Cost-conscious contractors on big and little jobs all over the country are using AJAX Cups to get approved safety messages into their workers' hands several times a day, when they're relaxed, receptive, ready to read.

Because they know – and the National Safety Council confirms it – that safety messages *that get read* do help reduce accidents. And a good accident record means lower insurance costs . . . can mean the difference between profit and loss on the job.

A TYPICAL EXAMPLE

(Actual case history from insurance company files)

A steel construction firm in one year paid insurance premiums of $3751. This included a charge, above the manual rate of 10.8%. The next year – despite a 5% increase in manual rate – their insurance cost only $3191 . . . because an active accident-prevention program had earned them a credit of 10%, saving hundreds of dollars in cost!

AJAX® CUPS and Drinking Water Tanks deliver fresh water to workers — mean less time lost on the job. AJAX Cups and Dispensers are also ideal for stationary tanks, barrels, pipeline faucets. 4 oz., 6 oz. and 7 oz. sizes packed imprinted with assorted stock safety messages—or your own message to order.

GET THE FULL STORY—Write us today for this new folder which gives full details on imprinted AJAX Cups and equipment.

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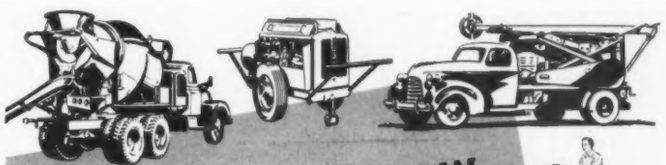

GOOD RULE TO FOLLOW WHEN BUYING ANY SPECIALIZED MACHINE:

CHOOSE A MAKE WHOSE BUILDER THINKS ENOUGH OF HIS OWN GOOD NAME TO EQUIP HIS PRODUCT WITH

•CONTINENTAL RED SEAL POWER•

Within Continental's range, from two to 1,100-horsepower, it would be hard to name a type of engine-driven product—vehicle, aircraft, boat, or industrial machine—of which one or more of the leading makes do not rely today on Continental power. As might be assumed from the current trend toward greater specialization, the list of such applications is longer than ever before. The field of Red Seal usefulness has broadened to the point where—as this list suggests—there is almost no end to the industrial uses of dependable Continental power.

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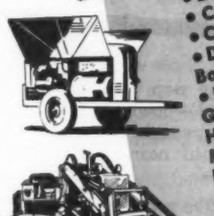

CONTINENTAL MOTORS Powerful as the Nation AMERICA'S STANDARD®

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Continental Motors Corporation

MUSKEGON, MICHIGAN

An Austin-Western Master 99 motor grader, with a dozer attachment in addition to its regular blade, shapes shoulders on the road. This machine also cuts ditches and backfills culverts. *C&E Staff Photo*

Three methods used to stabilize subgrade on old highway

IN rebuilding State Route 40 through peat swamps north of Dowagiac, Mich., Maclean Construction Co., Inc., Lansing, Mich., demonstrated three techniques for combating the poor subgrade conditions common to such areas.

Under one method, all unstable material is excavated down to sand. Under the second method, peat is excavated down to underlying marl; then a surcharged fill is placed to compact the marl. Under the third method, the old concrete pavement is left in place while a wide ditch is excavated through the peat on both sides of the road. When these ditches are backfilled with sand, the remaining peat is trapped under the old pavement. These methods of treating peat marshes are all standard in Michigan State Highway Department specifications.

This widening and reconstruction project, starting in the city of Dowagiac, extends 8.84 miles to the north. About four miles of the project consisted of widening the old 18-foot concrete slab to 22 feet with the addition of a 2-foot-wide strip of concrete on each side of the road. Grade changes required that a few sections of completely new pavement be included in this part of the work. Most of the peat was encountered in a 2½-mile section of continuous swamp. In addition to the swamp crossing, there was more than two miles of new construction on a new location at the extreme northerly end of the project.

The wavy and broken condition of the old pavement testified to the lack of stability of the peat as foundation material. The old slab, laid over a shallow sand fill, had failed in many places under the pounding of traffic. Even where total failure had not occurred, there was evidence of unequal settlement in many places. Subgrade preparation by all three methods was considered adequate to support the proposed flexible-type pavement.

Peat Excavation

Using the total excavation method, a Northwest Model 6 dragline with 1¾-yard Hendrix bucket excavated a 60-foot-wide section through as much as 20 feet of peat and marl to underlying sand. With its long boom, the dragline cast the waste material as far as possible to a spoil bank. As the unstable material was removed, sand backfill—hauled by Tournapull C Roadsters—was placed with the aid of a Caterpillar D7 tractor and dozer. This, the most costly method, was used where the old pavement was in very poor condition and where the peat and marl were particularly unstable. The total excavation method was also used in smaller swamps on the new location near the north end of the project.

Under certain conditions, it was felt that the marl which underlay some of the peat could be compacted to obtain the necessary stability. In such cases the peat was removed down to the marl, and sand backfill was placed in the excavation immediately. The sand squeezed some of the marl ahead, and this was bailed out by the dragline. The sand

NOTHING STOPS a mighty Manitowoc 4500!

Not even this solid mass of rugged rock can stop a powerful Manitowoc 4500! Yard after yard — load after load — this mighty of the mightiest keeps right on smashing out a broad path for a railroad near Cheyenne, Wyoming.

It can't be beat as a shovel — handles up to 5½ yards of rock like a handful of peanuts. Single, free-turning tubular stick rolls through saddle and makes digging shocks harmless. Complete diesel operation permits traveling anywhere without a trailing cable or electric supply.

It can't be beat as a dragline — it's "steady as she goes", with a low center of gravity; wide, long crawlers — providing maximum stability for long reaching booms — features that mean full capacity buckets on every dragline job.

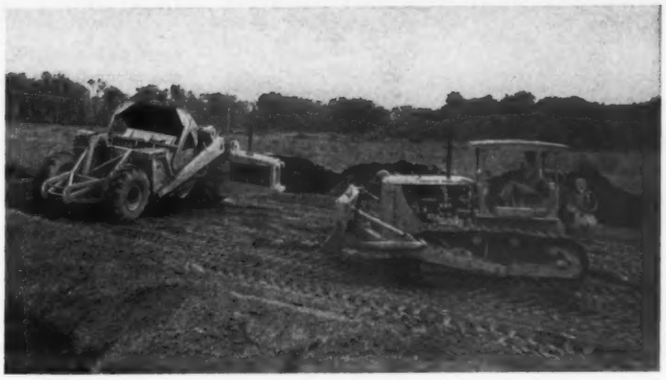
The 4500 main machinery is simple, powerful and fast, with only 15 gears and 8 sprockets — no lost motion — less maintenance and easy to service. All these advantages, plus the added power and performance of Manitowoc Torque Converter application.

See and get the facts on Manitowoc before you buy your next shovel or dragline.

4500 Dragline with 140' boom and 5 yard bucket building levee near Chester, Illinois.

MANITOWOC
SHOVELS 1-5 YD. Speed Crane CRANES 18-100 TON

Manitowoc Engineering Corp.
Manitowoc, Wisconsin



Granular material for backfilling trenches is unloaded by a LeTourneau-Westinghouse Tournapull C Roadster and dozed into place by a Caterpillar D7 dozer.
C&E Staff Photo

fill was then built up with a surcharge at least 5 feet above grade in an attempt to compact the remaining marl. The section was allowed to settle for two to three months before the remaining surcharge was removed down to grade.

Probably the most unusual method was the one in which the old concrete slab was left in place. Here it was assumed that the peat and marl under the old pavement had already been fairly well compacted, and that additional compaction could be obtained by operating heavy equipment on the old slab during construction operations. It was also assumed that if this peat were trapped under the old pavement by a firm sand fill on both sides, it would retain sufficient bearing value to support the new pavement.

To accomplish this, the Northwest dragline, operating on the old slab, dug a ditch 12 to 15 feet wide in the peat. In most cases, this material was not over 12 feet deep. The Tournapulls then brought in sand to fill the trenches and build a surcharge over the old slab. The dragline worked alternately on both sides of the pavement, digging out only a short section at a time. Backfilling was done simultaneously on both sides of the road to prevent lateral displacement of the peat and the old pavement.

Sand backfill was obtained from a borrow pit about a half mile from the highway. A Caterpillar D8 pushloaded the five Tournapulls in the pit. On a haul which was well in excess of a mile each way, scrapers made a complete round trip in 11 minutes, spending at least 1 minute in the loading cycle. An Austin-Western motor grader assisted in shaping the fills and maintaining the haul roads.

The same equipment built the relocated section at the north end of the project. This section was 40 feet wide from shoulder to shoulder, with 1 to 4 slopes. Several swamps in the area were handled by the total excavation and backfill method. An ample supply of good sand available near the right-of-way was used for a 12-inch subbase as well as for swamp backfills.

Place Gravel Surfacing

A 4-inch course of pit-run gravel was laid over the sand subbase, except in the sections where the existing pavement was widened. Six inches of plant-mixed clay-stabilized gravel was then spread over the pit-run material in two courses. A shop-made spreader attachment on the front of the Caterpillar D7 tractor and dozer laid the material in uniform 3-inch layers which were compacted with rubber-tire rollers.

To provide a dustless wearing course and preserve the gravel as a base for a future bituminous con-

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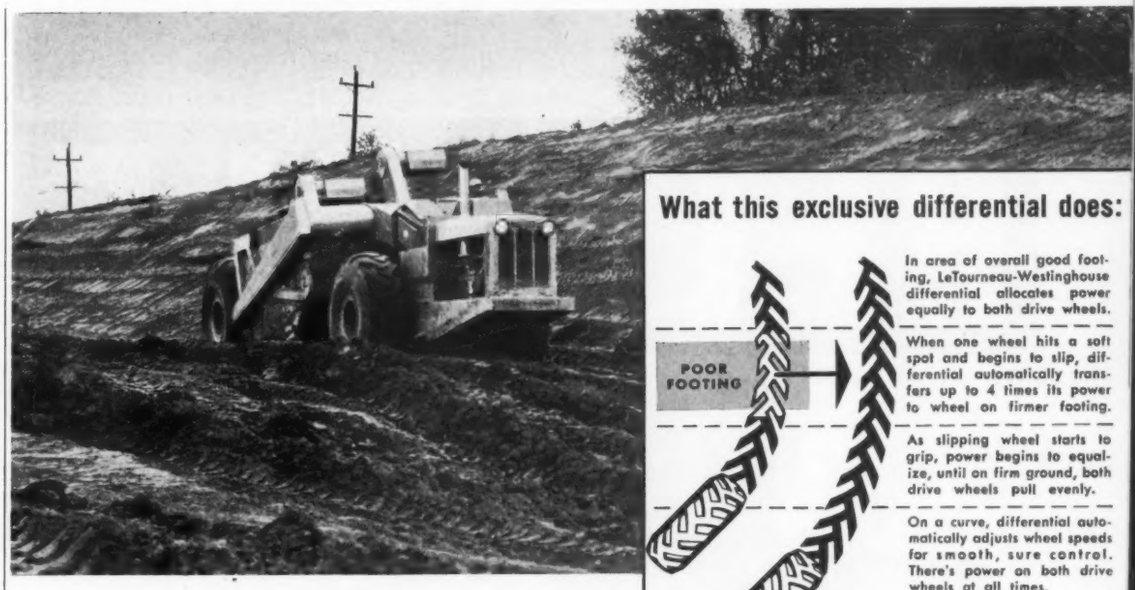


What this exclusive differential does:

In area of overall good footing, LeTourneau-Westinghouse differential allocates power equally to both drive wheels.

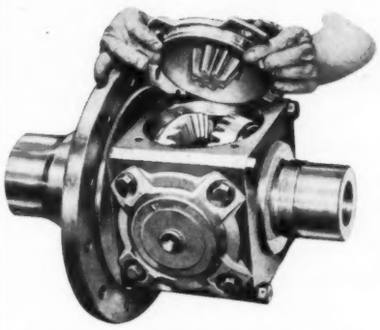
When one wheel hits a soft spot and begins to slip, differential automatically transfers up to 4 times its power to wheel on firmer footing.

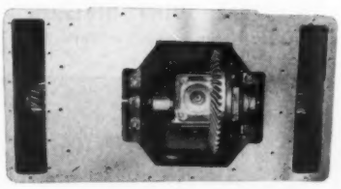
As slipping wheel starts to grip, power begins to equalize, until on firm ground, both drive wheels pull evenly.

On a curve, differential automatically adjusts wheel speeds for smooth, sure control. There's power on both drive wheels at all times.

Why you get more yards when

power is automatically transferred to wheel on firmest footin





With Tournapull differential, as soon as one wheel hits a slippery spot and tends to spin, idler pinions are forced outward against friction surfaces. This automatically slows the slipping wheel, and transfers up to 4 times its tractive effort to wheel on firmer footing. Neither wheel will spin independently until the 4 to 1 ratio is exceeded.

1. Since power is transferred where it can be best used, you pull through easily where other rigs bog down . . . haul loads where many can't pull through empty.
2. Wheel "spinning" is practically eliminated . . . tires don't cut in.
3. You can work in almost any material . . . mud, loose sand, snow . . . keep rigs earning in what is normally considered shut-down weather.
4. You can extend your work season earlier in spring, later in fall.
5. You ride curves easier, safer, faster because differential equalizes tire travel, gives you better traction and better control.
6. Tire wear is reduced through elimination of slipping, spinning.
7. There is less gear shifting necessary, less loss of momentum . . . you get faster cycles.
8. Power-transfer differential works automatically at all times . . . no control action needed . . . no special maintenance is required.

Investigate this revolutionary and exclusive power-transfer differential. It is standard on all LeTourneau-Westinghouse prime-movers . . . makes a major contribution to their ability to work a longer season, cut weather delay, haul larger loads through tough going, gives a faster cycle on any kind of footing.

Ask for a demonstration to see for yourself how this power-transfer differential can make more money for you. Why not do it now?

This power-transfer differential is used on all sizes of LeTourneau-Westinghouse electric-control Tournapull scrapers, rear-dumps, bottom dumps, flatbeds, cranes, and logging arches

Tournapull—Trademark Reg. U.S. Pat. Off. P-780-G

A Subsidiary of Westinghouse Air Brake Company

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

In sections where the old road is considered stable, lateral displacement of underlying peat and of the pavement is prevented by a sand fill placed on either side of the road. Here a dragline with a Hendrix bucket excavates a trench on one side of the road while a Caterpillar D7 tractor with dozer backfills a trench on the other side. *C&E Staff Photo*

(Continued from preceding page)

crete surface, the compacted gravel was primed with an application of 0.3 gallon per square yard of MC-O cutback asphalt. Cover aggregate was spread over the prime coat at a rate of 10 pounds per square yard. Following this, a seal coat of 0.3 gallon per square yard of RC-4A cutback asphalt was applied to the surface, and 20 pounds of cover aggregate was spread and rolled into the seal. The bituminous work was done under a subcontract by John Yerington, Benton Harbor, Mich.

Concrete Pavement Widening

In places where the old pavement was in good condition and needed only widening and incidental grade improvements, a 2-foot widening strip was placed on each side. A Huber maintainer with a special attachment for the job excavated a trench 9 inches deep alongside the old slab. A spreader, pulled behind the ready-mix trucks which supplied the concrete, did concrete widening work without the use of forms. Where changes in grade made it necessary, the old pavement was broken up by the Northwest crane using a breaker ball. After grading, a new slab was laid in these areas.

Shouldering, ditch improvements, culvert backfills, and other minor grading assignments were efficiently handled by a LeTourneau-Westinghouse Model D Tournapull and an Austin-Western Master 99 motor grader. The versatile scraper was able to get full loads without a pusher and deliver them quickly over considerable distances. The motor grader was equipped with a front-end dozer attachment in addition to its regular blade. With only the two operators, these machines did an amazing amount of grading and finish work behind the pavement-widening operation.

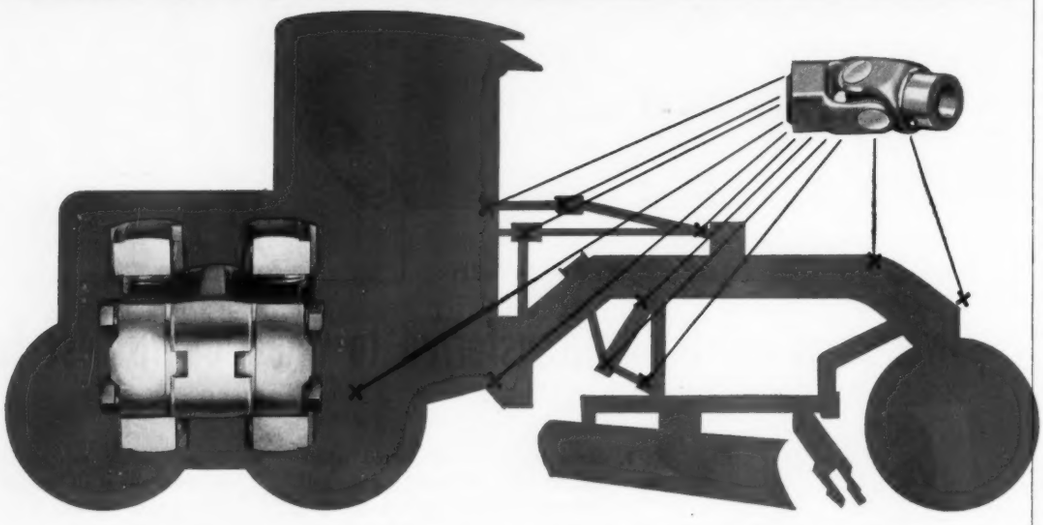
Quantities for this $530,000 highway improvement included 580,000 cubic yards of excavation, which was made up of the peat waste, sand borrow for backfill, and new grading. Concrete for the 9-inch-thick pavement widening, and for box culverts and a small slab bridge, totaled 6,200 square yards. Muck excavation and sand backfill started in February, 1954, and the entire project was completed early in December.

Personnel

Supervising the project for Maclean Construction Co. was Kenneth Maclean. President of the firm is A. D. Maclean, and vice president is Walter Toebe. The project was constructed under the supervision of District 7 of the Michigan State Highway Department of which J. E. Wilbur is district construction engineer. Project engineer for the job was Emil Platske. Harry C. Coons is chief engineer of the department.

THE END

RELIABLE



Whether for close-coupled main drive lines or for exposed steering and adjustment drives, designers with JOINT problems have learned to rely on MECHANICS. Where joints must run all day at high angles — where there are severe shock loads — where wide angles and long slip are common — and where dirt and/or moisture constantly are present — MECHANICS Roller Bearing UNIVERSAL JOINTS are the accepted solution. *Lubrication is so tightly sealed in that dirt and moisture cannot enter.* If you have a "tough" joint problem, make use of MECHANICS field engineers' wide experience.

MECHANICS UNIVERSAL JOINT DIVISION
Borg-Warner • 2030 Harrison Ave., Rockford, Ill.

MECHANICS
Roller Bearing BW
UNIVERSAL JOINTS
For Cars • Trucks • Tractors • Farm Implements • Road Machinery • Aircraft • Tanks • Busses and Industrial Equipment

Metal-Lath Fireproofing For Steel Structures

■ Information on metal-lath membrane fireproofing for steel structures is contained in a new technical bulletin from Metal Lath Manufacturers Association, Engineers Bldg., Cleveland 14, Ohio.

The literature contains a description of metal-lath membrane fireproofing and materials involved, together with construction details and fire resistive ratings for columns, beams, girders, trusses, and floor and roof-deck assemblies.

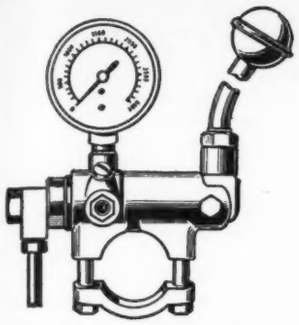
To obtain Technical Bulletin No. 3 write to the association, or use the Request Card at page 18. Circle No. 686.

Colorado Fuel & Iron Opens Buffalo Annex

A modern annex has been added to the fence mill of the Colorado Fuel & Iron Corp.'s Wickshire Spencer Steel plant at Buffalo, N. Y.

The new structure measures 105 × 40 feet and houses chain-link-fence galvanizing facilities. It is the hub of the plant's program for improving methods of handling, storing, processing, and loading Realock fence.

Booster Device Gives Vehicles Reserve Braking Power And Improves Driver's Control in Difficult Operations



Offering a means of gradually applying and releasing the brakes by hand, the Controlator frees the driver's feet for accelerating and clutching. This provides close control of the vehicle in hazardous operations.

■ A hand-operated auxiliary hydraulic cylinder available to contractors makes the operation of heavy vehicles safer and more efficient by providing the driver with extra control in difficult stopping, holding, and starting situations. The Controlator consists of a cylinder with a fluid chamber, piston, operating mechanism, and a line-pressure gage.

Installed between the master cylinder and the wheels, the device adds to the power of the vehicle's standard hydraulic brake system without interfering with normal braking.

With its control mechanism conveniently mounted on the steering column, the Controlator offers the driver a means of gradually applying and releasing the brakes by hand, freeing both feet for accelerating and clutching. The Controlator operates effectively whether the motor is on or off.

The device serves several functions. It can be used as a hydraulic brake that carries fluid and power in reserve for emergencies. It can be used as a power brake. It can also be used as a hydraulic hand control improving vehicle control where braking must be applied or released gradually. The device is also designed to serve as a brake lock.

Equipped with a line-pressure gage, it also provides the operator with a means for determining the amount of brake pressure needed or applied at all times, and for checking on the hydraulic system.

As an example of the usefulness of the Controlator to contractors, the manufacturer describes the use on dump trucks. In a typical operation in which a dump truck drops material over a bank at the bottom of an incline, the Controlator makes it possible for the truck to come to the exact edge of the drop-off, and hold its position while dumping.

By synchronizing the release of the brakes with acceleration and clutching, the driver can move the truck away without danger. The Controlator offers such control without the use of air or vacuum connections.

Similiarly, a cement-mixer truck which goes up and down inclines and dumps into basements or troughs can handle all these operations without any danger of rolling back. The operator remains in complete control of the vehicle.

The Controlator has also found successful application on vehicles equipped as post-hole diggers, cranes, hoists, loaders, and pipe layers. The advantage offered in each case is that the vehicle may be spotted precisely at the point on which it is to work and may then be moved a short distance with the load suspended in the air. As with the other work, there is no danger that the operator will lose control of the unit.

For further information write to the Power Equipment Co., 6000 Paseo, Kansas City 10, Mo., or use the Request Card at page 18. Circle No. 628.

Bulletin Gives Details On Wheel-Mounted Crane

■ A bulletin describing the Bucyrus-Erie 15-B transit crane rated at 15-ton capacity is now available. Illustrated by job application photos and closeups of mechanical features, the booklet includes a list of specifications and working ranges plus brief descriptions of the machine's major advantages.

The 15-B is a mobile ½-yard excavator-crane easily convertible to shovel, dragline, clamshell, or dragshovel for handling a wide range of lifting and excavating jobs.

To obtain Bulletin 15-B-TC-1 write to Bucyrus-Erie Co., South Milwaukee, Wis., or use the Request Card at page 18. Circle No. 627.

Aeroil Appoints Manager

Aeroil Products Co., Inc., South Hackensack, N. J., manufacturer of portable flame-fired equipment and specialized burner-sprayers, has appointed Irwin Abrams to the post of general manager. Now responsible for coordinating manufacturing and sales operations of the firm, Mr. Abrams will also retain his duties as treasurer and assistant secretary.

Two 16-yd. scrapers move 76,000 pay yds. in 25 days

Owner says, "Far superior to any other machine!"

The scrapers which earned such praise are the 2 C Tournapulls pictured above. Their owner is S. P. Lightholder of Canonsburg, Pennsylvania. The job was a 1750′ runway extension at the County Airport in Washington, Pa. — and it wasn't an easy one . . .

Material mostly shale, clay

Most of the 381,000 yards involved had to go into one 59 ft. fill. Base of the fill was shale and stratified limestone, 640 ft. wide and 1750 ft. long. Then came layers of gumbo and heavy clay . . . then a loam-top dressing 300 ft. wide and 1750 ft. long. For all this dirtmoving, only 150 days was allowed.

To Contractor Lightholder, this tight time schedule called for only a 130 hp crawler-tractor for push-loading and the two 16-yard Tournapulls.

His choice soon proved an excellent one.

Job ahead of schedule

In spite of rain which fell 5 of the first 11 working days, each Tournapull regularly completed a typical hilly 3000′ cycle every 4½ minutes. Loads in the wet mixed clay, shale, and limestone averaged 13½ to 14½ pay yards . . . combined output for the 2 sideboarded "C's" averaged 22 loads (297 to 319 pay yards) per 50-minute hour.

At the end of the first 11 days, total dirtmoving was accurately measured. Cross-sections showed that in the 99 working hours, the 2 C Tournapulls had delivered 34,400 cubic yards of fill. The job was well ahead of schedule!

At the 25-day point, when our photographer visited Washington, another estimate was taken. The two units then had moved 76,000 cubic yards. This pace was continued, and the work finished well within the allotted time!

Here's what the owner has to say:

Is it any wonder that Owner Lightholder, commenting on this performance, says, "Tournapulls are far superior to any machine I've ever owned or seen in action!" Let us show you a Tournapull in action to prove this statement! There's a size to fit your needs.

Rubber-tired C Tournapulls can travel over open country or paved roads at speeds to 30 mph. Owner S. P. Lightholder makes good use of this speed and roadability to take on small jobs that build extra earnings. One time during a lull in the airport job, he sent a "C" 58 miles to Greensboro, Pennsylvania, roading it over regular highways, to haul refuse and slate from a power company's coal washing plant. "The features on the C Tournapull make it an all-purpose tool," says Owner Lightholder.

Tournapull-Trademark Reg. U.S. Pat. Off. P-722-A-1

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

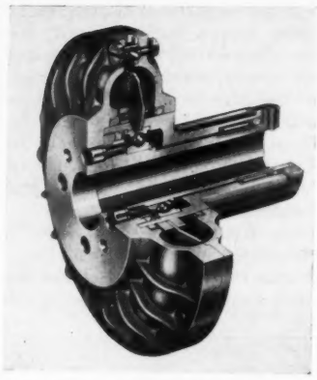
A Subsidiary of Westinghouse Air Brake Company

Steel Shot Replaces Fluid in New Drive That Does Not Slip in High Load Uses

■ A new development in industrial power transmission described as a dry fluid drive has been announced by Dodge Mfg. Co., Mishawaka, Ind. Using fine particles of spherical shot for power transfer—much as the conventional fluid drive employs hydraulic fluid—the new Flexidyne drive not only protects engines from damaging shock loads but also offers the further advantage of not slipping at normal operating speeds. Slipping occurs only under heavy inertia or high initial loads and overloads.

The point at which the Flexidyne drive will slip to protect the engine from damage can be set by varying the amount of shot or flow charge in the drive. Torque capacity can be set so that the drive will slip at anywhere from as low as 20 percent over full-load torque to as high as peak motor torque. The first Flexidyne drives to be available from stock will be four sizes rated at 3 to 30 horsepower at 1,800 rpm. Other sizes will be available later.

With these characteristics, the new drive is expected to find wide application in construction machinery such as compressors, conveyors, crushers, and other high-initial-load equipment. The manufacturer emphasizes that the drive will be especially suitable for outdoor use, giving dependable and consistent service regardless of temperature extremes. Requiring a negligible amount of maintenance, the drive is reported to have a long service life.



The new Flexidyne drive operates much like a fluid drive, but uses minute steel shot in place of fluid.

The Flexidyne drive is made up of a housing, inside of which there is a rotor that is free to turn concentrically. The fine particles of spherical steel shot, or flow charge, between the housing and rotor transmit power from the housing to the rotor. Easy to seal in, these particles have a high density and can stand relatively high temperatures.

The motor is connected to the Flexidyne housing and starts it turning at no load. The flow charge is thrown to the circumference of the housing, is compressed by centrifugal force, and revolves with the housing. The rotor, connected to the load, is started and accelerated by the friction and wedging action of the revolving flow charge, until the rotor and housing reach identical speeds. The Flexidyne drive operates with zero slippage between motor and load at normal running speeds, with constant torque produced for a given input speed regardless of the percentage of slip between the rotor and the housing, which occurs only during starting and overload.

Should there be an excessive overload, the Flexidyne rotor slips relative to the housing, overcoming the friction and wedging action of the flow charge before damage can be caused. A thermal switch automatically cuts the electrical circuit if an overload persists. This is available as optional equipment.

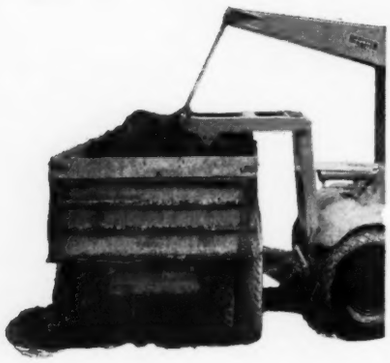
According to the manufacturer, the Flexidyne drive will permit the use of smaller motors with greatly reduced current demands and improved power factor, and will reduce maintenance on drives, gears, bearings, and driven machinery.

Two lines will be available, one offering Flexidyne drive for convenient mounting directly on motor shafts and adapted for Dodge Taper-Lock sheaves. A second line offers couplings with Taper-Lock bushings for straight-line drives.

For further information write to the company or use the Request Card that is bound in at page 18. Circle No. 752.

GET TRUCK PAYLOADS!

with the DEMPSTER DIGGSTER® GRD-101



The two photos above show some very important advantages you get when you use a Dempster-Diggster GRD-101. Photo directly above shows you why you have no truck shock with a Dempster-Diggster. You can lay bucket in truck body, trip latch and pull bucket up off load. Photo at right above shows you why you get a truck payload with a Dempster-Diggster . . . and how natural and easy it is to do so. This truck is now loaded to maximum heaped capacity, yet Dempster-Diggster has ample clearance. The dumping height is 9'6" and the digging height is approximately 15 feet. This enables the Dempster-Diggster to work with high dump equipment.

Other very important features of the new Dempster-Diggster GRD-101 include: AN EXCAVATOR THAT NEEDS NO WHEEL TRACTION (loading of bucket is accomplished by the exclusive Hydraulic Crowd and Hoist Action of the Dempster-Diggster) . . . TRUCK-SPEED MOBILITY TO AND FROM JOBS . . . AUTOMATIC BUCKET TRIP . . . MINIMUM TURNING RADIUS . . . THE SHOVEL WITH TORQUE CONVERTER . . . HYDRAULIC STEERING. Here's a shovel that gives you extra speed on the job and to and from jobs that means extra profits to you! Pound for pound, dollar for dollar, the Dempster-Diggster GRD-101 will out-dig and out-load any other available competing machine in tough going! Let us prove that statement! Write for complete information. Manufactured by Dempster Brothers, Inc.

DEMPSTER BROTHERS

DEMPSTER BROTHERS, 484 Shea Bldg., Knoxville 17, Tennessee

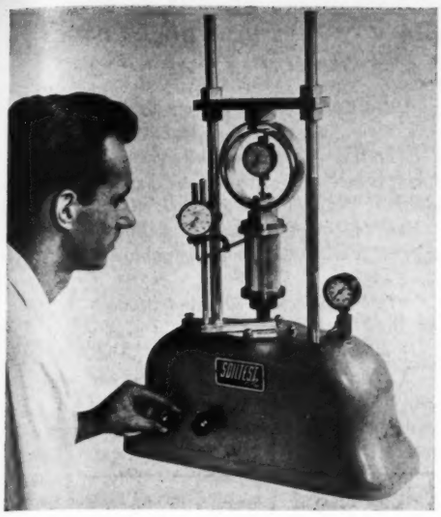
Waterproofing Method Uses Treated Fabric

■ The Karnak membrane system of waterproofing, which uses a strong asphalt-impregnated fabric with hot mop coats of waterproofing asphalt, is illustrated in literature from Lewis Asphalt Engineering Corp., 30 Church St., New York, N. Y. This type of waterproofing is specified for all below-grade foundations, bridges, viaducts, retaining walls, and tunnels. It provides a strong waterproof seal that will not break down under expansion, contraction, or constant water pressure.

The Karnak fabric used along with the liquid asphalt is an open-mesh material that allows surface coatings to penetrate and interlock. This provides a firm mechanical bond between coatings.

The asphalt-saturated fabric is manufactured in rolls 50 yards long and in 4, 6, 12, and 36-inch widths. It unrolls easily and can be applied without wrinkles.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18 of this issue. Circle No. 725.



This unconfined compression testing machine can be used on the job to test soil characteristics. The drive is reported to give dependable and consistent service regardless of temperature extremes.

Technical Data on Cement With High Early Strength

■ A technical bulletin containing specification data and complete details for proportioning and mixing Medusa high-early-strength portland cement is available on request.

Specific examples are given for the use of this Type III portland cement. These include its use for concrete that must be put into service at an early date. The cement is also used in industrial, highway, and other maintenance work where repairs must be completed rapidly.

Other applications are in the manufacture of concrete products, where it is used to increase production and permit re-use of molds, and in winter concreting, where it reduces the protection period.

To obtain this literature write to Medusa Portland Cement Co., 1000 Midland Building, Cleveland 15, Ohio, or use the Request Card at page 18. Circle No. 652.

Welding Catalog Lists Supplies and Accessories

■ The complete line of Air Reduction arc welding and oxyacetylene welding supplies and accessories is illustrated in a new booklet available on request. Included in this catalog are welding rods, fluxes, brazing alloys, goggles, helmets, shields, electrode holders, and protective clothing. The booklet also illustrates cable, clamps, hose, lighters, cylinder trucks, etc.

To obtain Form ADC 848, write to Air Reduction Sales Co., 60 East 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 633.

Soil-Testing Machine

■ A new Soiltest unconfined compression testing machine for soils has been developed for on-the-job or laboratory testing to determine strength characteristics of cohesive soils. The tester applies a load of 500 pounds to the specimen, with loads measured on a sensitive double-proving ring assembly. The 35-pound testing machine will accommodate specimens up to 2½ inches in diameter.

For further information write to Soiltest, Inc., 4520 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 753.

Booklet on Operation Of Curb-Laying Machine

■ A folder available on request describes the operation of the Canfield curb-laying machine. Concrete of reasonably dry mix, asphalt at approximately 220 degrees, or soil cement in proportions depending upon available materials is fed into the hopper of the curb layer. It is there extruded through worm gear into the curb mold under high pressure. The compaction of the mass causes the machine to move backward on the line marking.

Three men are required to run the machine. On straight runs, up to 1,500 feet can be laid in an eight-hour day, according to the literature. The curb laid is an oval 7½ inches high and 8 inches wide at the base.

To obtain this literature write to The Canfield Corp., P. O. Box 439, Salisbury, N. C., or use the Request Card at page 18. Circle No. 645.

Unused Surplus Trucks Available to Contractors

■ Unused U. S. Government surplus trucks available to contractors are shown in a bulletin from the American Truck & Machinery Corp., P. O. Box 5085, Tulsa, Okla. The company offers GMC and International 6×6's and Ford 4×4's, all complete with chains, spare parts, and spare tires.

The concern emphasizes that the trucks are still in their original unused condition, and that every engine has been started at regular intervals so that the vehicle is ready to work at the time of purchase. Trucks available include dump trucks, cargo trucks, and units with front winches.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 636.

It's Etnyre for even distribution at Douglas Oil Company of California

Douglas Oil Co. of California, located in Paramount, operates the front engine drive Etnyre "Black-Topper" shown above. The distributor is aluminum-jacketed, with stainless steel rear head.

The entire organization is "high" on the "Black-Topper." A. H. Peterson, Douglas driver, says: "Our Etnyre gives us positive control, even distribution, and smooth operation."

Woody Green, operator of the distributor, chimes in with "It takes a good machine and experience for tack coating, and our Etnyre does a real job."

The clincher comes from V. R. Marichal, Assistant General Manager, who writes: " . . . it has always given entire satisfaction on our jobs and to other operators that we know who use them."

You, too, can have the distributor which has no equal for accuracy, dependability, and long-life economy. Instead of putting up with second best, get in touch with your nearby Etnyre Dealer or write E. D. Etnyre & Co., Oregon, Illinois, U.S.A.

SEE YOUR ETNYRE DEALER

ETNYRE

"Black-Topper"

BITUMINOUS DISTRIBUTORS

A Look at Earthmoving

Land Clearing

With this issue, CONTRACTORS AND ENGINEERS begins publication of a series of articles consisting of excerpts from the new book, "Moving the Earth", published last month by North Castle Books, Greenwich, Conn. This 1,200-page book, reviewed on page 48 of this issue, covers all phases of excavation and is profusely illustrated. Herbert L. Nichols, Jr., author of "Moving the Earth", also is the author of "How to Operate Excavation Equipment", excerpts from which were recently published in this magazine.

"Moving the Earth" is priced at $15, and is available through the Book Order Department of CONTRACTORS AND ENGINEERS, 470 Fourth Ave., New York 16, N. Y. If you would like a copy of the book on approval, circle No. 1 on the Request Card at page 18. Copies sent on approval will be billed at $15 plus postage.

Clearing usually involves removal of vegetation, which may be grass and weeds, brush, trees, and stumps. Other material which may be taken away before actual dirt work starts includes boulders, walls, and buildings or their foundations.

A dozer is the standard machine for clearing. It works best when the ground is firm and without potholes, gulleys, sharp ridges, and rock. Uneven surfaces make it difficult to keep the blade in contact with the ground and lead to burial rather than removal of vegetation in hollows. However, there are a few places where a dozer cannot aid hand clearing crews by clearing large areas, moving logs and cut brush, and cutting roads for supply trucks.

Dozers have a particular advantage over hand crews where briars and vines are abundant. These are very tedious to cut by hand, but can be readily stripped off by a dozer blade providing the operator does not take too long a pass and get the machine caught in the tangle.

Light dozers, of the 2-ton class, can work on very soft ground if it is crusted or covered with sod.

Brush and small trees may be removed by a bulldozer walking with its blade in light contact with the ground.

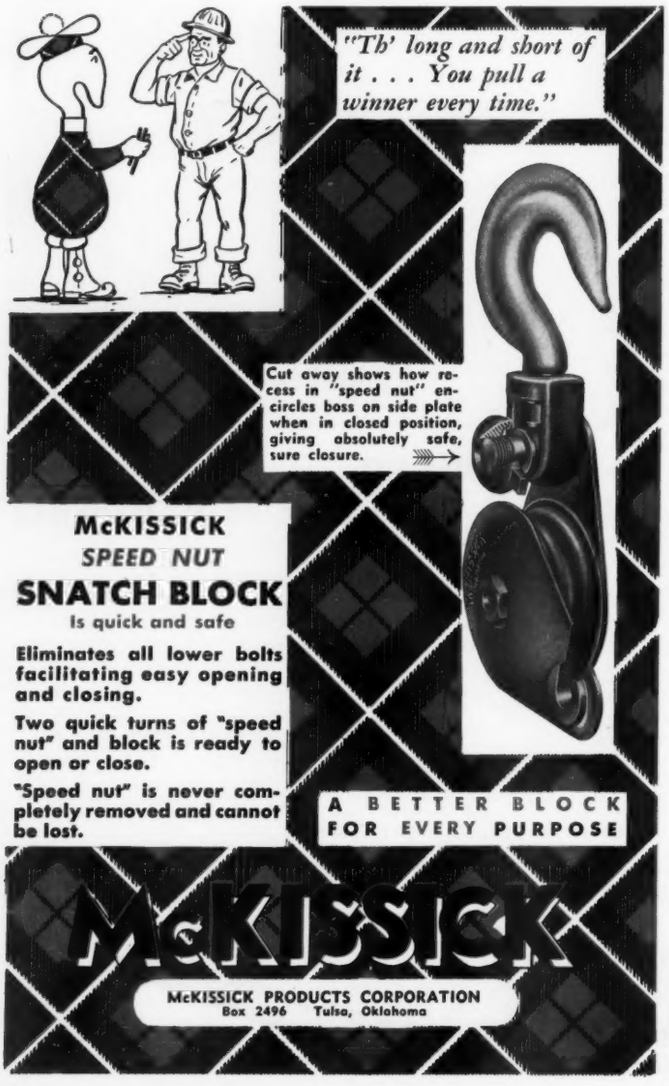
Brush heaps may be largely freed of dry loose dirt by rolling them over with the blade and shaking the blade up and down. If this is ineffective, rolling them over backwards or pushing them from the side may be tried. A dozer with a blade which can be easily tilted down at either end is very good at clearing work, as one corner can be used for taking out roots and pushing piles without taking a bladeful of dirt along with it. The blade may be returned to flat position in order to skim off surface brush.

Rake Blades

The best tool for grubbing is a special dozer blade having teeth projecting downward from a solid edge. These brush rakes enable the teeth to work below ground level, taking out roots as well as surface material while allowing the soil to sift back to the ground through the spaces between the teeth. These machines will remove small or loosened stumps and loose rock in the same operation.

A shovel dozer with a hydraulic dump bucket fitted with teeth does the same job, except that the teeth are shorter and therefore do not penetrate as deeply or sift dirt as well. This machine can also pick piles up and carry them or put them on trucks, build very high piles, dump brush on top of fires, compact brush over a sulky fire by patting it with the bucket, and pep up a fire with the forward-moving air current from its reversed radiator fan.

Any sort of mechanical removal of brush that is to be burned should be done when the soil is dry for best results. If it is dug in the wet, a lot of mud will stick to it. This can some-


"Th' long and short of it . . . You pull a winner every time."
Cut away shows how recess in "speed nut" encircles boss on side plate when in closed position, giving absolutely safe, sure closure.
McKISSICK
SPEED NUT
SNATCH BLOCK
Is quick and safe
Eliminates all lower bolts facilitating easy opening and closing.
Two quick turns of "speed nut" and block is ready to open or close.
"Speed nut" is never completely removed and cannot be lost.
A BETTER BLOCK FOR EVERY PURPOSE
McKISSICK
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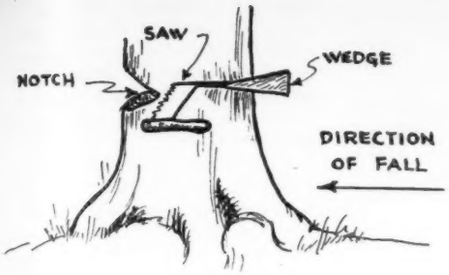
Box 2496 Tulsa, Oklahoma

MODEL J
Enables you to work close to buildings, driveways, narrow alleys, etc.
HI-WAY SPREADERS SPEED
SEAL COATING OPERATIONS
4 MODELS TO MEET ALL REQUIREMENTS!
NEW FEATURES YOU'VE BEEN LOOKING FOR!
HI-WAY Spreaders—with their exclusive combination of engineering features—help you do those Seal Coating jobs faster . . . Better! Before you make any Spreader purchase, be sure you have the facts on these features of HI-WAY Spreaders.
Forward and Reverse spreading
Adjustable width spreads
Volume controlled by feedgate
Positive drive—metered spread
No free flowing—eliminates waste
Spreads all granular materials
Simple one-man operation
Quickly attached and detached
No controls to install in truck cab
Interchangeability with different dump bodies
MODEL DD
Can be attached and detached in one minute affording its use with several trucks.
MODEL R
Spreads forward or reverse with control of material flow. Has worldwide acceptance.
MODEL AS
Equipped with hydraulically operated shutoff gate. Spreads from ½" to 4" in depth.
WRITE for FULL INFORMATION and your HI-WAY DEALER'S NAME
HIGHWAY EQUIPMENT CO., Inc.
616 D Ave., N.W., Cedar Rapids, Iowa
Manufacturers of The World's Most Complete Line of Spreaders and Bulk Material Delivery Equipment



Use of saw and wedge.

times be shaken out again when dry by rolling and pushing the piles.

Work Patterns

In agricultural clearing, vegetation is frequently pushed into straight windrows, where it is burned after drying or allowed to decay. The width of cleared aisles will depend on dozer power and the heaviness of the growth. Single pushes may range from 50 to over 200 feet.

The simplest method of windrowing is to push from two directions toward a center line. This has the disadvantage, however, of burying some vegetation without loosening it, which will increase difficulties in burning or removing the pile, and may require further clearing after the burning operation.

If it becomes necessary to remove a tangled heap, a large dozer, clamshell, dragline, or hoe shovel may have to be used. Taking the heap apart by hand might be more costly than the original clearing.

When piling coarse brush or trees, it is often advisable to have them cut into lengths of 10 to 20 feet after uprooting. This will enable the dozer to handle larger loads and to place them more accurately. Also, piles can be more readily separated or moved if necessary.

In general, it is the best practice to burn machine-cleared vegetation soon after it is piled. A hot fire, including heavy wood, is prepared and brush piles pushed up on it. A new fire is made when the push gets too long.

Best results are obtained if the vegetation is uprooted and allowed to dry at least a few days before burning. This may be done by backing the dozer into the woods from the cleared edge and uprooting small patches or individual trees, pushing them clear of the ground and then leaving them in small piles to dry.

When a dozer is clearing dense undergrowth, there is the danger that it will fall into some hole—natural or artificial—concealed by the brush. This may be guarded against by scouting the area on foot and by moving the dozer forward in a succession of short pushes overlapping each other on the side. This enables the operator to watch from one side, without getting branches

THIS TRADEMARK IDENTIFIES THE MORSE-STARRETT Wire Rope Cutter
MORSE-STARRETT PRODUCTS CO.
MORSE-STARRETT
MODEL NO. 1
MO-ST
PAT. NOS. 1743404 1769001
CABLE CUTTER
OAKLAND, CALIFORNIA, U.S.A.
EASY
No special skill is required in the hammer-blow operation of this perfect wire rope cutting tool.
CLEAN
The cut is clean, smooth, without jagged ends; the wire rope is easy to thread or splice.
FAST
Ten Seconds, or less, is the usual time required to complete the smooth, clean cut.
SAFE
The operator is safe, because the blade is enclosed and locked in the body of the tool.
SEE YOUR DEALER OR WRITE DEPT. "M"
MORSE-STARRETT PRODUCTS COMPANY
1304 - 49th AVENUE
OAKLAND 1, CALIFORNIA

Another Leading Contractor Depends on Sturdy, Efficient Cummer Plants for Faster Production, Less Down Time.

HERE'S PROOF...
that Cummer "True Portability" increases asphalt plant tonnage *for Extra Profits!*

Don Wells, Inc., widely-known contracting firm of Detroit, Michigan, knows from actual experience that the "True Portability" of Cummer Asphalt Plants is an important factor in successful contract bidding.

Cummer Portable Asphalt Plants are true to their name. They are actually portable—easily and economically—and are state-approved. For that reason, Don Wells, Inc., can go after jobs, whenever available, that involve 8 to 10 thousand tons of asphalt. Without a Cummer Portable Plant, this firm might have to pass up such profitable business.

The Don Wells-Cummer Portable pictured here is completely wired, ready to plug in to a diesel generator set. Lifting hooks are installed for speedy handling. Folding legs (for example, on the dryer) fold up to frame, fold down to grade on timber foundation—concrete is not necessary. Note dust-collecting equipment which discharges reclaimed dust into hot elevator.

Like so many other contractors, Wells says that it gets more than guaranteed minimum capacity—thanks to Cummer's exceptionally rugged construction.

A new, fully-illustrated catalog, giving complete specifications on all types of plants with equipment and accessories, is now available. Send for your copy today.

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THE F. D. CUMMER & SON CO.
1827 EAST 18th ST. • CLEVELAND 14, OHIO

ROCKFORD

HIGH TORQUE

EASY OPERATION
HIGH TORQUE
POSITIVE ENGAGEMENT
LARGE DRIVING AREA
SMOOTH RUNNING
INFREQUENT ADJUSTMENT
MINIMUM INERTIA

* Equally spaced, hardened and ground roller cams, bearing upon hard steel insets, exert heavy pressure evenly over the entire ROCKFORD Over-Center CLUTCH face—producing unusually high torque, for the clutch size and weight.

Send for This Handy Bulletin
Shows typical installations of ROCKFORD CLUTCHES and POWER TAKE-OFFS. Contains diagrams of unique applications. Furnishes capacity tables, dimensions and complete specifications.

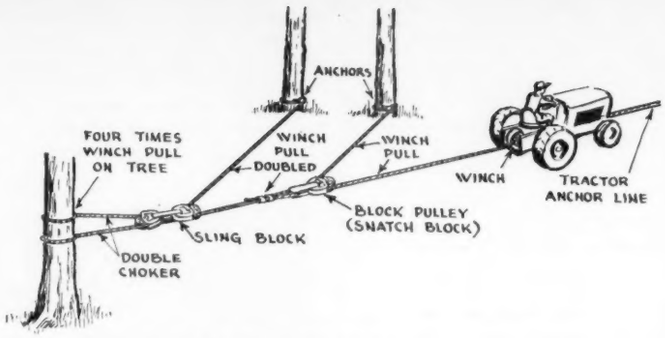
ROCKFORD CLUTCH DIVISION BORG-WARNER
▲ 314 Catherine Street, Rockford, Illinois, U.S.A. ▲

CLUTCHES

in his face, and to observe the nature of the ground. In addition, it avoids tangling the dozer in branches.

Any dozer used for clearing work should be thoroughly protected with crankcase and radiator guards, the latter including a screen with holes not over ¼ inch and accessible for removal of leaves and trash. Care should be taken not to let branches jab into the fan or radiator while the machine is backing up, or to allow them to tangle with hydraulic hoses or other vulnerable parts at any time. The operator should carry hand pruners and an ax or machete to cut himself out of tangles.

Accidents have been caused by branches moving throttle and clutch controls.



Sling-block setup for pulling stumps and small trees.

Cable Drag

Two powerful dozers or tractors may start land clearing by moving through the growth on parallel paths, dragging a heavy cable between them. This cable should be strong enough to take the pull of both tractors, and long enough not to pull trees on top of them. On the first pass, the cable will pull over most of the vegetation, uprooting or breaking off some. A return trip is made on the same paths, uprooting most of the remainder under favorable conditions. The loosened material is then piled by clamshells, or by dozers—preferably with rake blades.

A third dozer may follow closely to help with any tree which the cable cannot handle, and push out overturned stumps. Trees to be salvaged for lumber may be sawed by the conventional saw-and-wedge method.

Weeds, soft sod, and light to medium brush may be chopped up by a heavy disk harrow. The attachment should be weighted down and towed by a tractor powerful enough to travel several miles an hour, as speed increases the disk harrow's effectiveness.

Stump Blasting

The most serious problem in tree clearing is presented by stumps. A few species are valuable enough in certain localities so that they can be sold for more than the cost of digging, but the vast majority of them are worthless and present a difficult disposal problem.

Dynamite may be used to blow stumps clear of the ground, to loosen or lighten them, or to break them into pieces. Stumps respond best to slow-acting dynamites, but the standard 40 per cent grade will usually give satisfactory results.

A heavy enough charge should be placed to blow a crater in the ground large enough to include the stump and its major roots. A pound of dynamite should move about a yard of dirt, but the charges ought to be varied according to results obtained.

Stump blasting is dangerous work at best because of unpredictable conditions underground. A rock may be held just over the charge by roots in a position that will cause it to take off like a mortar shell. Split pieces of wood will also fly great distances. Mud or earth packs over charges should be inspected for stones, and personnel should move a long way back from the blast, unless good shelter is available.

Stump blasting is generally ineffective in sandy or powdery soils, as the force of the explosion flows around the roots with minimum breaking effect. These soils also fall off the stump rather readily without blasting.

Pulling Stumps

A standard method of taking out stumps is to pull them by means of a line around the trunk. The line may be a chain, cable, or rope, and the power may be direct pull by a machine or animal, winding in of cable on a winch (either machine or hand powered), or a combination of these methods with pulley blocks.

The stump line is generally a choker type which tightens its grip as the pull increases. In smaller sizes, chain is preferred because it is easier to carry, safer to handle, and more resistant to abuse. However, it is much heavier than cable for the same strength, and in large sizes is too weighty to be practical.

The most powerful, most convenient, and best controlled pull is obtained from winches. These are most efficient mounted on crawler tractors, but may be on wheel tractors

Penetration Macadam (Specification No. 1) used for surfacing a business parking lot.

EMULSIFIED ASPHALT... ideal for surfacing DRIVEWAYS

Dense-Graded Plant Mix (Specification No. 4) being applied to Penetration Macadam base for heavy-duty industrial parking area.

A private drive and subdivision street surfaced with Open-Graded Plant Mix (Specification No. 2).

Emulsified asphalt is a tested and proven material for paving driveways, parking lots, playgrounds, subdivision streets, walks, and similar areas. In addition to the cold-mix process specifications previously available for paving projects of different types, *Mastic-Mix* (Specification No. 11) and *Driveway Construction* (Specification No. 12) are the latest in the list of emulsified asphalt specifications available from McConnaughay Licensees. *Mastic-Mix*, designed for use as a surface coat over one of the standard mixes, is laid by machine, trowel, or broom to form a smooth, tough, resilient pavement . . . highly resistant to wear, water and heat, yet surprisingly economical. The specification for *Driveway Construction* covers construction methods recommended for use with emulsified asphalt.

Information on the specifications above or any of those in the box at right will be mailed immediately at your request. You can be sure of getting accurate information and fast, dependable service on asphalt emulsions and mixes by calling any of the McConnaughay Licensees listed. Take advantage of this exceptional service. Get in touch with your nearest McConnaughay Licensee or contact . . .

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E. A. Mariani—Emulsified Asphalt
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P. O. Box 267, *Terre Haute, Ind.*
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17th & Gharkey Sts., *Muncie, Ind.*
Fauber Construction Co.
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Asphalt Materials & Construction, Inc.
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Ready-Mix Asphalt, Inc.
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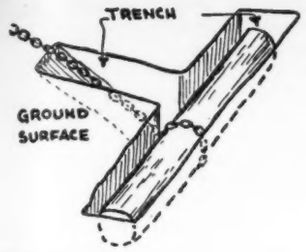
SPECIFICATIONS OF THESE COLD-MIX PROCESSES AVAILABLE ON REQUEST

1 — Penetration Macadam, 2 — Open-Graded Plant Mix, 3 — Open-Graded Road Mix, 4 — Dense-Graded Plant Mix, 5 — Dense-Graded Road Mix, 6 — Mat Coat, 7 — Seal Coat, 8 — Sand Mix, 9 — Sand Honing, 10 — Patching, 11 — Mastic-Mix, 12 — Driveway Construction.

K. E. McCONNAUGHAY LAFAYETTE INDIANA
EMULSIFIED ASPHALT PLANTS AND PROCESSES



Artificial anchor.

or trucks, or be portable units operated by a hand crank. For general clearing work, the most effective tool is a bulldozer carrying a power winch.

If pulling stumps takes the full power of the tractor or winch, it may be advisable to use snatch blocks to obtain greater power at slower speed. These devices, known also as blocks and as pulleys, are pulleys set in frames that are provided with one or two round hooks or rings, usually on swivel connections. For most field work, single pulley wheels with a latch attachment permitting insertion of a cable at the side are best, as cables usually carry attachments too large for threading. Even when possible, this is a tedious job.

Series and sling blocks may be used to multiply the winch pull in these operations. A log placed in the crossbar of a T-shaped trench may be used as an anchor.

Trees and their stumps may also be pushed over or dug out by a bulldozer. The blade is raised as high as possible to contact the stump near the top, and walked into it with the machine in low gear. If the tree yields, the push should be continued until the blade loses effective contact, or until the roots under the tractor bulge. The dozer should then be backed and the blade dropped under the upturned roots.

Selection of Machinery

Big machines and special rigs greatly reduce time, effort, and breakage in clearing work, and should be used whenever a job is large enough to justify their purchase or hire. Stumps that can be knocked right out of the ground may be removed at the rate of one a minute or better; moderately resistant ones may take 2 to 5 minutes; and those which are definitely oversize may take an hour or more. It is easy to see the time that can be saved by applying overwhelming power.

Disposal

Burning is the usual method of disposal in clearing operations. A hot fire is built and the stumps pushed or lowered into it as they are taken out, or after they have been allowed to dry for a time. Instead of putting the stumps directly on a fire, they may be piled up and allowed to dry for from 6 months to 2 years, then burned. Such a heap may be difficult to light unless piled on brush or other kindling, but once any part of the pile is burning strongly, the fire should spread to other parts readily. Stump fires are very hot and may burn for weeks.

Any contractor burning brush in an area subject to brush or forest fires is liable to heavy responsibility if one of his fires spreads. Back-pack fire extinguishers, which consist of a water tank carried like a knapsack, a flexible hose, a hand pump, and a nozzle, are important pieces of equipment. If streams or ponds are available, the contractor's pumps—particularly the light centrifugal type—are very valuable. Tree-spraying outfits also make good fire fighters. A bulldozer can very effectively put out a fire by starting behind the blaze and smothering it with sod.

Boulders and Foundations

If large enough machinery and suitable disposal points are available, rocks may be turned or dug out and pushed away. If they are too large for easy handling and disposal, it is usually advisable to dynamite or cut them down to size.

Old foundations and other masonry structures usually yield readily to heavy machinery. High walls should be pulled down, as they might fall on a machine pushing them. If a foundation is too strong for available machinery, it may be weakened by blasting along the lines where it meets the floor and other walls.

Occasionally an excavating contractor may be called upon to move small buildings of minor value out of the work area, or to drag his work buildings around on a job. The easiest method is to jack the building up, or to lift it one end at a time with a shovel or crane, and pull a pair of substantial skid logs under it. It may then be pulled on this skid frame by one or more tractors.

(To Be Continued Next Month)

There were only five fatalities on the New York Thruway for the 205,138,657 vehicle miles traveled on the road last year.

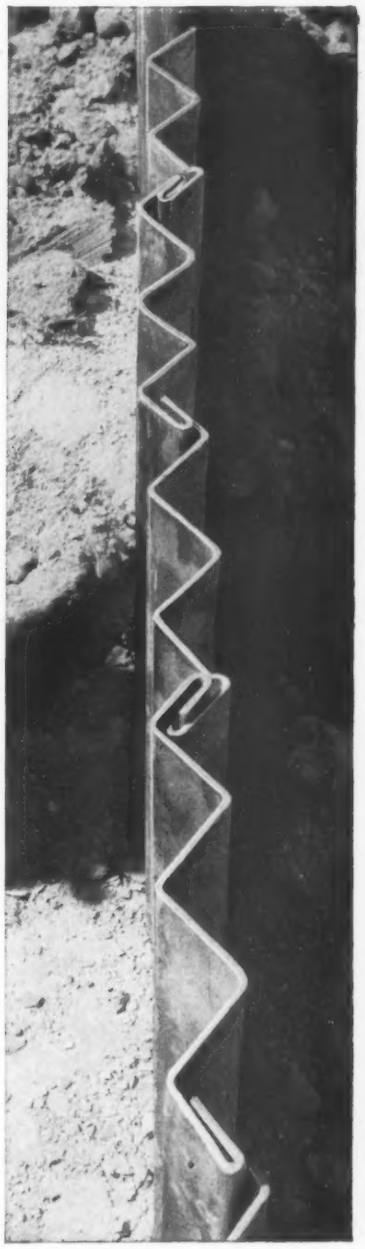
Booklet Describes Graders And Windrow Loader

■ A new booklet describes the entire Adams road machinery line, covering motor and pull-type graders and the Adams TraveLoader windrow and stockpile loader.

The booklet lists specifications for and describes the mechanical features of four models of motor graders powered by engines rated at 75 to 140 bhp. It also illustrates optional equipment for the motor graders, including scarifier, slide-shift moldboard, power-shift moldboard, bulldozer, snowplow and snow wing, enclosed cab, and the Elegrader loading conveyor.

To obtain Form 551 write to Adams Division, LeTourneau-Westinghouse Co., P. O. Box 853, Indianapolis, Ind., or use the Request Card at page 18. Circle No. 684.

ARMCO STEEL SHEETING
SIMPLIFIES
CONSTRUCTION JOBS



Practically every construction job involves some problem in controlling the movement of soil or water. And many of them can be solved—easily, quickly and economically—with Armco Steel Sheeting. Here are the advantages you get with the reasons for them.

STRONG, LIGHTWEIGHT Because Armco Sheeting combines the advantages of durable metal and corrugated design you get a high strength/weight ratio.

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There are two types of Armco Sheeting: Interlocking and Flange. Principal difference is that Interlocking is used where practical watertightness is required. Both are supplied in a range of gages and in lengths up to 20 feet. Write for data. Armco Drainage & Metal Products, Inc., 4935 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

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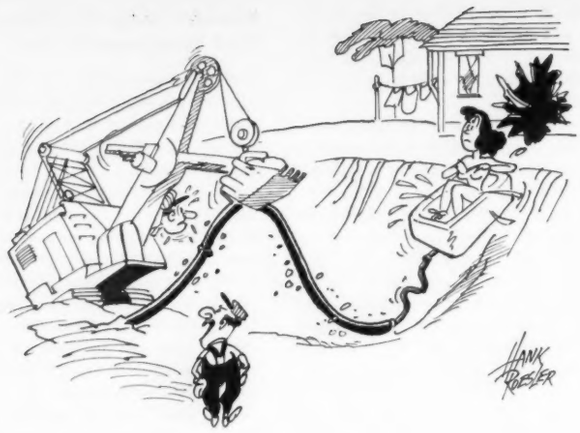

"I told you to take it easy!"

Articles Discuss Concrete Batching and Mixing

■ A series of articles discussing the fundamental principles of concrete batching and mixing has been reprinted under one cover by the C. S. Johnson Co., Champaign, Ill.

Originally prepared by the firm's chief engineer, Theodore B. Appel, Jr., the series deals with such basic topics as portable and semiportable batching plants; single and multiple material batchers; weighbeam and scale adjustments; highway, airport, and ready-mix concrete plants; permanent plant facilities; and controls for large mass concrete plants.

The articles present a frank discussion of the history of concreting for all types of structures and surfaces. They also discuss equipment selection, application, and maintenance; production factors; and job engineering.

To obtain Form No. KJ414, write to the company, or use the Request Card at page 18. Circle No. 661.

Tubular Heater Starts Cold Diesel Engines

■ A new General Electric tubular heater is reported to start diesel engines quickly even in subzero weather. The new product was developed for the Caterpillar Tractor Co., and after extensive testing has been found to be a reliable electrical starting system, according to G-E engineers.

A component part of the diesel engine, the tubular heater is about the size of an ordinary lead pencil and is installed in the engine's precombustion chamber. When the engine is cranked, power from the batteries is transmitted to the heater, which reaches a temperature of 1,800 degrees F in 30 seconds.

As an indication of the starting ability of the device, General Electric cites a number of tests made by Caterpillar engineers. In one such test a novice operator easily started a D4 tractor that had been parked outdoors for an entire winter. The same tractor was started within an average cranking time of 1.15 seconds following a week-end period in which it had been subjected to subzero temperatures with the engine housing cover removed.

For further information write to Industrial Heating Dept., General Electric Co., Schenectady 5, N. Y., or use the Request Card at page 18. Circle No. 614.

Bin-Level Indicator

■ A level indicator used in bins, conveyors, and chutes for handling granular, lumpy, and wet materials is described in literature available on request.

The Convair Bin-Vue level indicator, consisting of a 1/200-hp motor turning at 5 rpm, is connected to a shaft by means of a torsion spring, alongside of which is placed a limit switch. At the end of the shaft there is a 4-blade paddle which is free to turn as long as material does not touch it.

Once touched by material, the paddle stops and the motor keeps on turning until the spring by torsion actuates the limit switch, which kicks out the motor and actuates any other desired equipment.

To obtain this literature write to Convair Inc., P. O. Box 967, Pittsburgh 26, Pa., or use the Request Card at page 18. Circle No. 678.

Dump Bodies and Hoists

■ An illustrated bulletin covering the entire line of Heil truck equipment is available on request. The literature describes standard Heil dump bodies and twin-arm hoists, as well as lightweight telescopic hoists and dump bodies designed exclusively for the latter units. Conversion hoists, rock bodies, and the Heiloader hydraulic elevating truck tailgates are also covered.

To obtain Bulletin BH-54120 write to The Heil Co., 3073 W. Montana St., Milwaukee 1, Wis., or use the Request Card that is bound in at page 18. Circle No. 669.

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The location of the boom hinge points on new Sherman loaders provides extra reach.

Components for Hydraulic Power-Steering Systems

■ A catalog describing standard Vickers components for hydraulic power-steering systems is now available from Vickers Inc., 1400 Oakman Blvd., Detroit 32, Mich. These include the Series S-23 power-steering boosters, vane-type power-steering pumps, the combination volume control and overload relief valve, and an oil reservoir.

Circuit diagrams show four types of power-steering systems, based on these components, which can be assembled to fit a variety of installations on truck and material-handling equipment. The new catalog also contains line drawings of typical applications of hydraulic power-steering boosters in which various axle, frame, and steering-column-mounting conditions are involved.

To obtain Bulletin M-5106 write to the company, or use the Request Card at page 18. Circle No. 617.

How to Keep a Check On Compressed-Air Waste

■ A new service bulletin describes how to find out how much air is wasted through defective compressed-air lines. It then tells, step by step, the procedures to be taken to bring the system up to accepted standards.

The booklet can also help in the design of new systems. It contains diagrams of different types of piping networks and tables of friction losses of air in pipe, fittings, and hose.

To obtain this literature write to Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., or use the Request Card at page 18. Circle No. 735.

Front-End Loaders Offer Increased Reach

■ Two new hydraulic front-end loaders for Fordson Major tractors offer extended reach at maximum and intermediate heights. The frames of both models are designed to distribute stresses safely along the entire tractor frame. The location of the boom hinge points on both models gives the Sherman Loaders their extra-long reach.

The two models are the AJ-20 with a 2,000-pound lift capacity and a 3,500-pound breakaway capacity, and a larger model, the AJ-25, that lifts 2,500-pounds and has a 4,500-pound breakaway capacity. Both have a maximum loading height of 10 feet 10 inches. Struck bucket capacities are ½ yard and ⅝ yard, respectively, on the AJ-20 and AJ-25.

For further information write to Sherman Products, Inc., Dept. 514, 3200 W. 14 Mile Road, Royal Oak, Mich., or use the Request Card at page 18. Circle No. 638.

Cellular Glass Insulation In Thin-Wall Construction

■ Recognizing the increasing use of the new thin-curtain-wall construction techniques, the Pittsburgh Corning Corp., has prepared a booklet describing the use of Foamglas insulation in thin wall and sandwich panel construction. Foamglas is an expanded glass thermal insulating material that is made up of minute dead-air insulating spaces that are sealed against moisture.

The literature shows typical projects in which the insulating material was used in conjunction with porcelain enamel panels, aluminum and stainless steel facings, concrete panels, and in spandrel construction.

To obtain this literature write to Pittsburgh Corning Corp., One Gateway Center, Pittsburgh 22, Pa., or use the Request Card at page 18. Circle No. 668.

Crane Carrier Expands

A new line of ready-mix trucks, specialized trucks for construction purposes, and crane carriers will be made in the Tulsa, Okla., plant recently acquired by Crane Carrier Corp., Tulsa. The plant, which more than doubles the firm's manufacturing facilities, is the former Hinderliter Tool Co. plant.

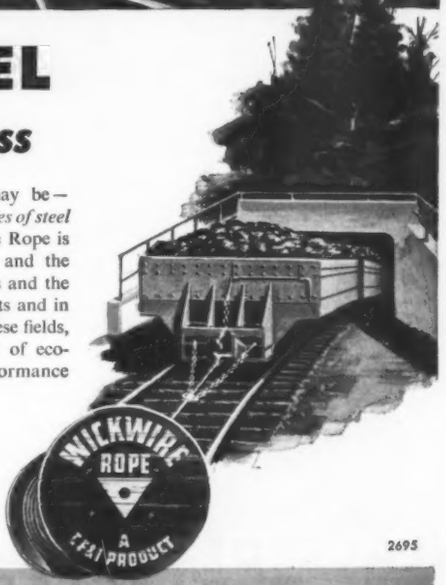
MUSCLES OF STEEL

put the mules out of business

Oldtimers in coal mining can remember when mule-power was the only means of transportation in the mines.

Today's efficient coal mining demands big-capacity mechanized equipment. In modern underground mines, wire rope serves as *muscles of steel*—pulling cars from the loader to discharge point. In strip mining, also, wire rope provides the *muscle* for huge stripping shovels.

No matter what the job may be—wherever there's need for *muscles of steel*—it's a safe bet that Wickwire Rope is busy at work. In the mines and the quarries. In the logging camps and the oil fields. With the fishing fleets and in materials handling. In all of these fields, Wickwire Rope has a record of economical and dependable performance that can't be beat.



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AVOID LEGAL PITFALLS

Subcontractor's Surety's Liability Was Limited

THE PROBLEM: *A subcontractor's performance bond specified that he and his surety were bound to the contractor "in the amount of $4,950", for the faithful performance of the subcontract. In case of default by the subcontractor, the surety could remedy the default, complete the contract, or secure bids for completion. He could also make available sufficient funds for completion, "less the balance of the contract price but not exceeding it and including the costs and damages for which the surety may be liable thereunder, that is, the amount set forth" ($4,950). The subcontractor defaulted—partly because he was delayed by another subcontractor. Without giving the surety a chance to take over, the contractor exercised his right to take over and complete the job, and later sued the subcontractor and the surety for resulting loss. Although the contractor proved right to collect $13,908.84 against the subcontractor, was judgment against the surety properly limited to $4,950?*

THE ANSWER: Yes. (Bill Curphy Co. v. Elliott, 207 Fed. 2d 103, decided by the United States Court of Appeals.)

The court decided that, read as a whole, the bond did not entitle the contractor to reimbursement by the surety in excess of the sum stated in the bond.

Extra Pay Denied

THE PROBLEM: *A subcontractor agreed to install equipment in a hospital building for $64,000 and later, when further construction was provided for, he agreed to install additional equipment for $1,235. Was the subcontractor entitled to claim more than the original $1,235 because of increased cost in performing the additional work due to refusal of the prime contractor's employee to permit both jobs to be carried on at the same time?*

THE ANSWER: No. (Bearden v. Smith, 274 Pac. 2d 1015, decided by the Oklahoma Supreme Court.)

The court intimated that the subcontractor could not complain because he was required to complete the original contract work before proceeding with the additional work. The court also hinted that by accepting a check for the amount called for by the two contracts, which was tendered him as "payment in full," the subcontractor waived any further claim, although he sent a letter denying that the check was payment in full.

Excavator Not Liable

THE PROBLEM: *The plumbing contractor on a housing project sublet ditching, without requiring the excavating contractor to slope, shore, or brace the ditch sides. The last ditch, 30 inches wide and 5 feet deep in sandy clay earth, was completed and turned over to the plumbing contractor. An employee of the contractor was suffocated when a side of this ditch caved in. Was the subcontractor liable in damages?*

THE ANSWER: No. (Sumner v. Lambert, 121 N. E. 2d 189, decided by the Ohio Court of Appeals, Montgomery County.)

The court said that the excavator was in the clear because he fulfilled his contract, which did not require shoring or other safeguards against cave-ins. Furthermore, he did not leave an abnormally dangerous situation, and the owner had accepted the job.

Bidder Is Entitled To Return of Deposit

THE PROBLEM: *A bidder on road work for an Illinois town made a deposit to secure compliance with his bid, but the bid was not accepted because of a mistake in it. The town board passed a resolution authorizing a contract at a higher price, but it was not signed by the town officers. Was the bidder entitled to return of his deposit?*

THE ANSWER: Yes. (Western Sand & Gravel Co. v. Town of Cornwall, 119 N. E. 2d 261, decided by the Illinois Supreme Court; reversing a decision by the Illinois Appellate Court, 350 Ill. App. 93, 111 N. E. 2d 861.)

The decision rested in part on the fact that the town records did not show that a bid had been accepted, although the Illinois statutes required that the town clerk record orders and directions relating to highways. The Supreme Court said that it had repeatedly decided that, under such statutes, municipal records afford the only legal evidence of proceedings.

Lien Law Covers Plans

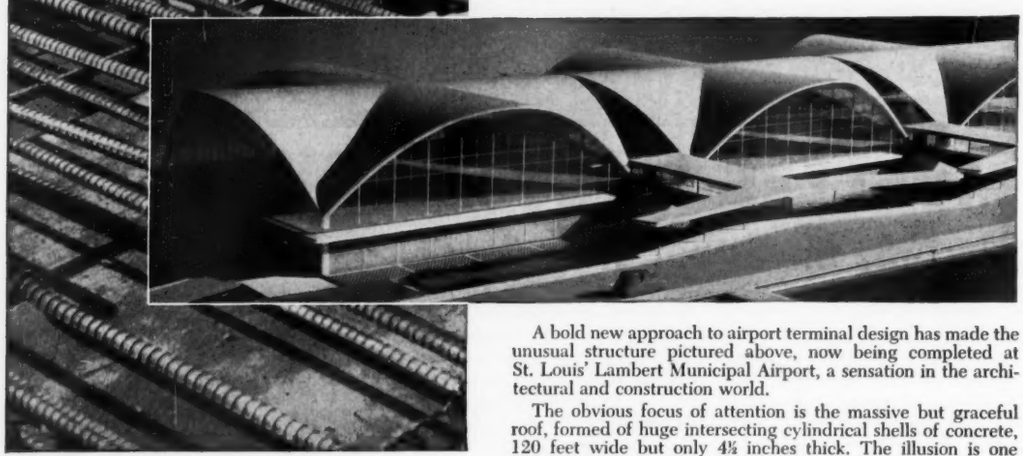
THE PROBLEM: *The New York Lien Law, which allows mechanics liens for charges for labor and materials furnished in the "improvement of real property", specifies that "improvement" shall include plans drawn by an architect or engineer. Can an architect enforce a lien for mere rough sketches?*

THE ANSWER: No. (Bralus Corp. v. Berger, 120 N. E. 2d 829, decided by the New York Court of Appeals.)

The Court said that more than

Laclede Reinforcing Bars

. . . the "backbone" that gives strength and support to St. Louis' amazing new Airport Terminal Building



A bold new approach to airport terminal design has made the unusual structure pictured above, now being completed at St. Louis' Lambert Municipal Airport, a sensation in the architectural and construction world.

The obvious focus of attention is the massive but graceful roof, formed of huge intersecting cylindrical shells of concrete, 120 feet wide but only 4½ inches thick. The illusion is one of lightness and airiness, belying the roof's actual weight of 3,000 tons.

Because there are no internal supports, inherent strength is of special importance in a building of this type.

Much of that strength is provided by the use of Laclede Multi-Rib Round Reinforcing Bars, not only in the roof but throughout the entire terminal.

These Laclede-designed bars represent the perfect balance between high strength and maximum anchorage, and are enjoying ever-widening use by contractors throughout the nation.

Architects: Hellmuth, Yamasaki & Leinweber, St. Louis
Structural Engineer: William C. E. Becker, St. Louis
Engineering Consultant: Roberts & Schaefer Co., Chicago
Contractor: L & R Construction Co., St. Louis

LACLEDE

LACLEDE STEEL COMPANY

SAINT LOUIS, MISSOURI ◆ Producers of Steel for Industry and Construction

ALLIS-CHALMERS PRESENTS TWO NEW, POWERFUL DIRT MOVERS

...meeting the stepped-up needs of the construction industry for more power...better performance...longer life!

the HD-21

204 net engine hp
44,000 lb

Introducing

- A Great New Power Team with New Allis-Chalmers Diesel Engine and Advanced Design Torque Converter!
- 20% Greater Over-all Tractor Performance!
- New Durability Clear Through!

the TS-360 MOTOR SCRAPER

280 hp
20-yd capacity

- Higher Standards of Production!
- New Long-Life Strength!
- More Operator Advantages!
- New Design, Construction and Service Simplicity!

Bigger-better! Tested-proved! READY NOW!

NEW BIG-YARDAGE WORK CAPACITY

Power that pays The TS-360's great new Allis-Chalmers engine spearheads a whole new power train that offers more rim pull at all speeds for better loading, hauling and spreading performance . . . faster acceleration, easy shifting and quick getaways. Combined with new 20-yd capacity, this all adds up to fast, high-volume, high-profit work cycles.

New operating ease and safety In addition to big-job power and gearing, the TS-360 Motor Scraper offers everything an operator needs to work easily, yet efficiently . . . new Double-Safety air brakes, new selective steering, direct electric starting, new multiple-disc cable control . . . and many others you'll want to know more about.

Strength to back it up! The new TS-360 is built around a new, all-welded, heavy steel main frame that makes possible the service accessibility of unit construction. What's more, there's an all-new final drive gear train, with new gears, shafts and bearings. These and many other advantages mean more work done, lower maintenance cost and longer equipment life.

ALLIS-CHALMERS

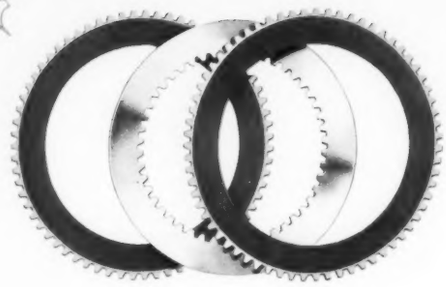
TS-360

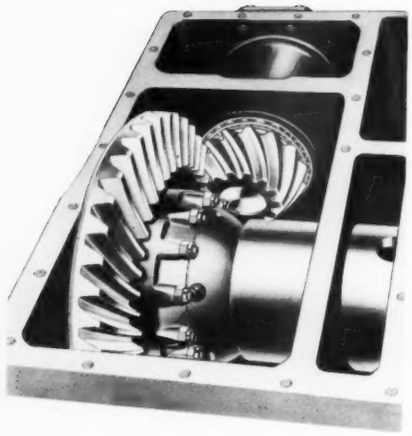
SPECIFICATIONS

The inside facts

New multiple-disc cable control

With a new safeguard switch that automatically stops cable travel at maximum lift . . . prevents cable shock, increases cable life.





NEW . . . FR

New heavy-duty gears

The TS-360's ring, pinion, differential and final drive gears are completely new in design and weight to produce new standards of strength and durability.

ALLIS-CHALMERS

TS-360

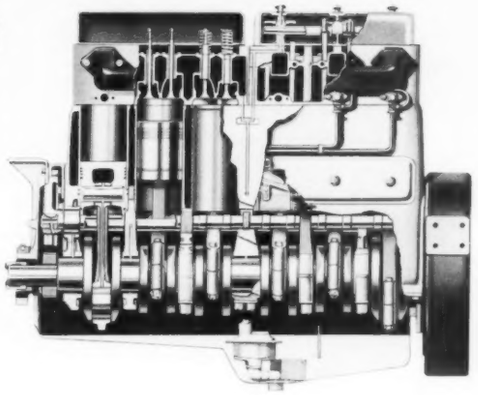
MOTOR SCRAPER

New operator comfort

Plenty of leg room, convenient control, no fan blast, conning tower visibility.

New high-torque Allis-Chalmers engine

Here's an 844-cu-in. power plant that delivers smooth power over a wide range of speeds . . . with plenty in reserve to assure real dependability and low operating cost.

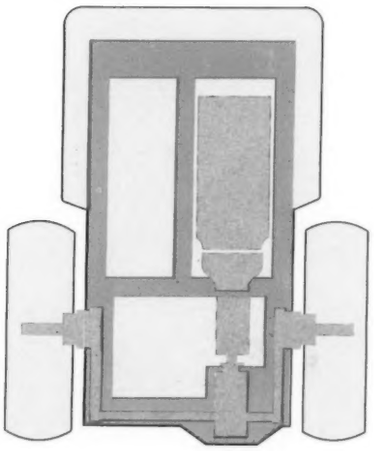


New direct electric starting

Provides easy, all-weather starting with a turn of the key.

FRONT TO BACK

Built to outperform!



CAPACITY	**Struck, cu yd—15** **Heaped, cu yd—20**	
SPEEDS mph at 2100 rpm	**First**	**3.0**
	Second	**6.1**
	Third	**11.3**
	Fourth	**20.0**
	Reverse	**3.1**
WEIGHT	**49,000 lb**	

SPECIFICATIONS

New serviceability

With its new main frame, the TS-360 offers the simplicity of unit construction... easy removal and servicing of both major and minor assemblies.

New double-safety air brakes

Assure ample braking pressure at all times.

New selective steering

Provides a controlled flow system for easy maneuverability in tough going . . . fine control for safe, high-speed steering on the haul road.

New low-mounted headlights

Insure maximum road illumination for nighttime operations. Sealed Beam lights easily adjustable to any position.

Nowhere can you match these two . . .

BIGGEST MOST POWERFUL CRAWLER IN PRODUCTION...ANYWHERE!

New standards of output The HD-21 introduces the new Allis-Chalmers engine and a great new power transmission team. Together, they provide extra speed with any load, extra pulling power at any speed . . . wider speed ranges and more range overlap. And with its advanced design torque converter (*the result of 15 years of experience by Allis-Chalmers*) the HD-21 puts its power to work with less shifting than ever before possible . . . to help you reach a new high in efficient, profitable production!

New standards of durability From the new Allis-Chalmers diesel with "follow-through" combustion to new, heavier Tru-Dimension track, the HD-21 is built to take today's big loads in stride, and come back for more. Here are just a few more of the long-life features you can't get from anyone but Allis-Chalmers . . . at any price: all-steel Box-A main frame, straddle-mounted final drive gears, 1,000-hour truck wheel lubrication, oil-enclosed track release mechanism.

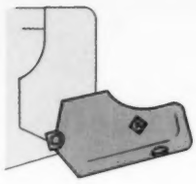
New low cost per unit of work The HD-21's outstanding performance and durability provide a new measure of tractor value. Add the *planned* approach to service offered by Allis-Chalmers dealers, and it's the ideal team for men tackling today's *big* jobs.

SPECIFICATIONS

ALLIS-CHALMERS

HD-21

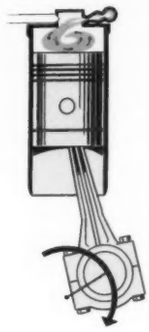
The inside facts



New "wrap-around" radiator guards

The cost of mounting bulldozers is reduced because hydraulic rams or cable-lift sheaves mount directly on new "wrap-around" guard. For easy service accessibility, guard tilts forward.

New Allis-



NEW...FROM TRACK

Built to outlast all others!

SPECIFICATIONS

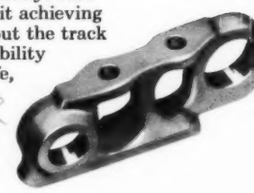
WEIGHT 44,000 lb
204 flywheel hp

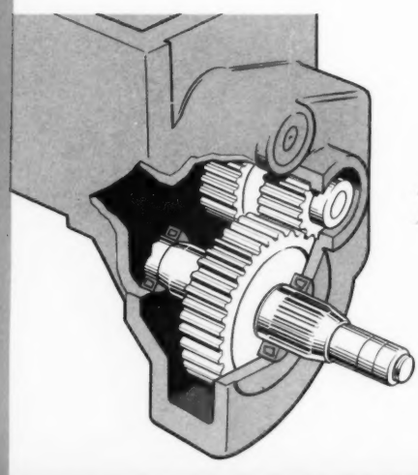
SPEEDS

Gear Range	Speed mph
Low	0–3.0
High	0–7.5
Reverse	0–5.5

New True-Dimension track

New in design, heavier and stronger . . . plus new advances in wearability. New heat-treating methods permit achieving optimum hardness throughout the track sidebar for maximum wearability and toughness . . . longer life, more time on the job.





New, heavy straddle-mounted final drives

Provide ample strength for today's bigger mounted equipment, bigger loads. And the HD-21's entire final drive assembly rides in a rigid, one-piece steel case, with *all* gears straddle-mounted on tapered roller bearings to insure better performance, longer life.

A host of new features

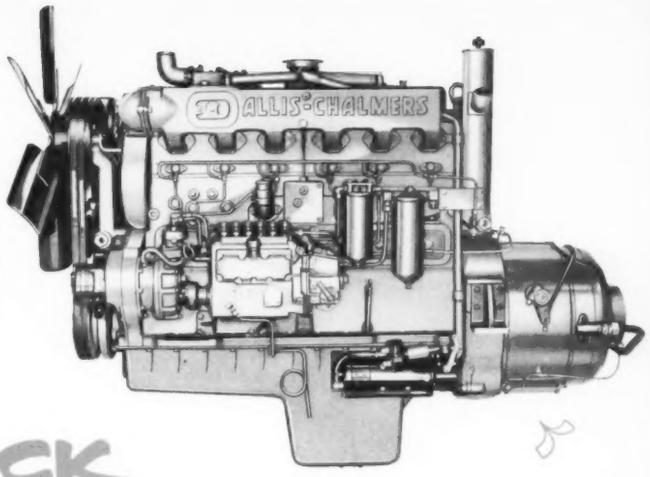
Heavyweight front idlers and truck whee high-capacity cooling system . . . separat exchanger for torque converter . . . stress main frame . . . heavy-duty 135-gal fuel foam rubber seats and arm rests . . . ma

. . . in the amount of work they do!

ew Allis-Chalmers engine

Brings you top performance, extra-long life through a new kind of "follow-through" combustion. Here's why—

The key explosion occurs in the energy cell as shown, unleashing a blast that sets up cyclone turbulence. Result—no damaging peak pressures . . . instead, higher average and sustained working pressures and more effective leverage on the crankshaft. *Be sure to ask your Allis-Chalmers dealer for the visual story revealing the full advantages of this new engine.*



CK TO STACK

ers!

Great new engine-torque converter-transmission team

The new Allis-Chalmers engine's characteristics combine with the HD-21 torque converter to produce a new kind of high-output performance. Combined with a new transmission, it brings you closer to complete elimination of shifting than ever thought possible.

The HD-21 will do *20 percent more work* . . . give you lower cost per unit of work and higher profit. And your operators will never have it so easy!

ALLIS-CHALMERS
HD-21
DIESEL TRACTOR

es
nounted
entire
ece
on

tures
nd truck wheels . . .
m . . . separate heat
rter . . . stress-relieved
y 135-gal fuel tank . . .
rests . . . many others.

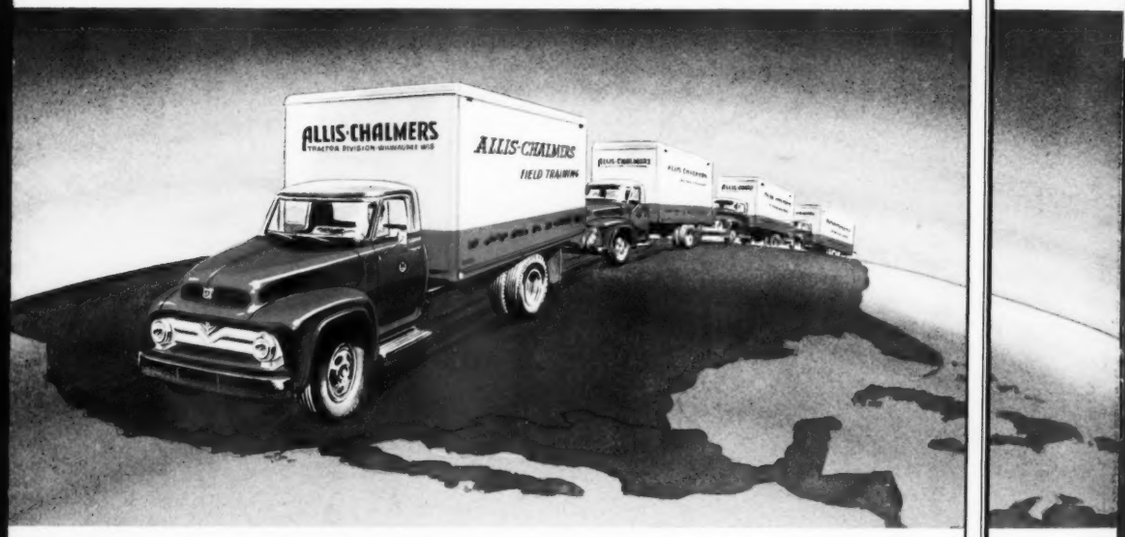
lo!

The new HD-21 and TS-360 are

BACKED BY ALLIS-CHALMERS DEALER SERVICE PLAN

Yes, your Allis-Chalmers dealer offers you original factory parts for both the HD-21 and TS-360 . . . plus a *planned* approach to service, right from the day equipment is delivered. It covers factory service schools, in-the-field lubrication schedules, operating tips and preventive maintenance.

You owe it to yourself to take full advantage of the Allis-Chalmers Dealer Service Plan to keep your equipment operating efficiently. Experience *proves* that it pays big dividends.



FIELD UNITS TO SPAN THE NATION

Specially-equipped trucks from the Allis-Chalmers Training Center, Springfield, Illinois, are on their way to the field *now*, as a special service backing up the introduction of the HD-21 and TS-360. First trips will bring factory specialists to locations all over the country to present the story on these great new dirt movers and their service advantages.

For all the facts on when one of the Field Units will be in your vicinity . . . plus full information on planned service, see your nearby Allis-Chalmers dealer.

ALLIS-CHALMERS
TRACTOR DIVISION · MILWAUKEE 1, U. S. A.

MS661-5503

Printed in U. S. A.

Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

rough sketches are necessary in order to make charges lienable. Preliminary plans are covered by the statute when they were prepared to assist the owner in deciding whether or not to build.

Truck Injures Surveyor

THE PROBLEM: *A truck driver saw a surveyor operating a transit at a street intersection while the truck was 50 or 60 feet away and approaching the intersection at 25 or 30 mph. He did not slow down, sounded no warning, and drove straight ahead. The left front of the truck struck and injured the surveyor. Assuming that he negligently failed to guard against the accident, was the surveyor entitled to damages if the truck driver did not use due care to avoid the accident?*

THE ANSWER: Yes. (Wawner v. Sellic Stone Studio, 74 So. 2d 574, decided by the Florida Supreme Court.)

The court ordered a new trial after a jury refused to award the surveyor damages under an improper instruction that if the surveyor had been negligent, he could not recover, regardless of the truck driver's carelessness.

Right to Interest

THE PROBLEM: *Oregon state highway construction was completed and accepted September 30, 1949. In January, 1950, the State Highway Commission issued a final estimate, showing that $14,971.54 was due the contractors. In January, 1951, on the contractors' objection to that estimate, the estimate was raised to $16,949.98. The commission refused to raise it further, and suit followed to require issuance of an estimate of $18,680.61, for which the courts awarded judgment. Were the contractors entitled to interest on the amount of the judgment from the date when the amount should have been paid?*

THE ANSWER: Yes. (Eldon v. Chandler, 275 Pac. 2d 748, decided by the Oregon Supreme Court.)

Equipment Lessor Was Liable for Accident

THE PROBLEM: *In laying a pipeline, a contractor hired a front-end loader and an operator from the defendant. Defendant was paid $50 per day for use of the loader and the operator, paying the operator's wages after tax deductions and social security contributions. The contractor had no control over the operator other than to direct where dirt was to be picked up and dumped. While the operator was loading, he suddenly moved the loader backward and injured plaintiff, an employee of the contractor. Was defendant liable in damages to plaintiff?*

THE ANSWER: Yes. (Mature v. Angelo, 97 Atl. 2d 59, decided by the Pennsylvania Supreme Court.)

The court said that the fact that defendant came to the work site to see whether the operator was giving proper service to the contractor was not a necessary factor in fixing his liability. The decisive factor was that defendant had a right to exercise control over operation of the loader—within the directions given by the contractor as to where dirt was to be loaded and unloaded—and not whether he actually exercised such control.

Progress Payments Improperly Withheld

THE PROBLEMS: (1) *Did a district sanitary engineer improperly withhold approval of progress payments under a construction contract because there were inadequate district funds to make the payments?* (2) *Did withholding of the payments constitute such a breach of contract by the district as to justify the contractor in abandoning the work and suing for the reasonable value of work done?* (3) *Is an engineer's estimate of the amount due the contractor as progress payments binding upon the contractor if it is fraudulent and calls for less than is due the contractor?* (4) *Could the district justify withholding from progress payments a larger percentage of money earned than provided by the contract on the ground that the contractor had delayed paying material bills? The latter ground was asserted after the contractor had ceased work because of excessive withholding of payment.*

THE ANSWERS: (1 and 2) Yes. (3 and 4) No. (Smith v. Empire Sanitary District, 273 Pac. 2d 37, decided by the California District Court of Appeal, Third District.)

The court said that it was not necessary for the contractor to make a formal and specific demand for payment before suing. It was enough that he had objected to withholding of payment due him and had notified the district that he would cease work if the payment were not forthcoming.

A Zoning-Law Decision

THE PROBLEM: *Defendant owned a large lot in a New Jersey town and was using part of it for storing heavy equipment when a restrictive zoning ordinance was adopted. Under state law, defendant was entitled to continue that use. Could he extend the use to that part of the lot which had not been used for storage purposes, if he had not previously indicated that he would do so?*

THE ANSWER: No. (Martin v. Ces-

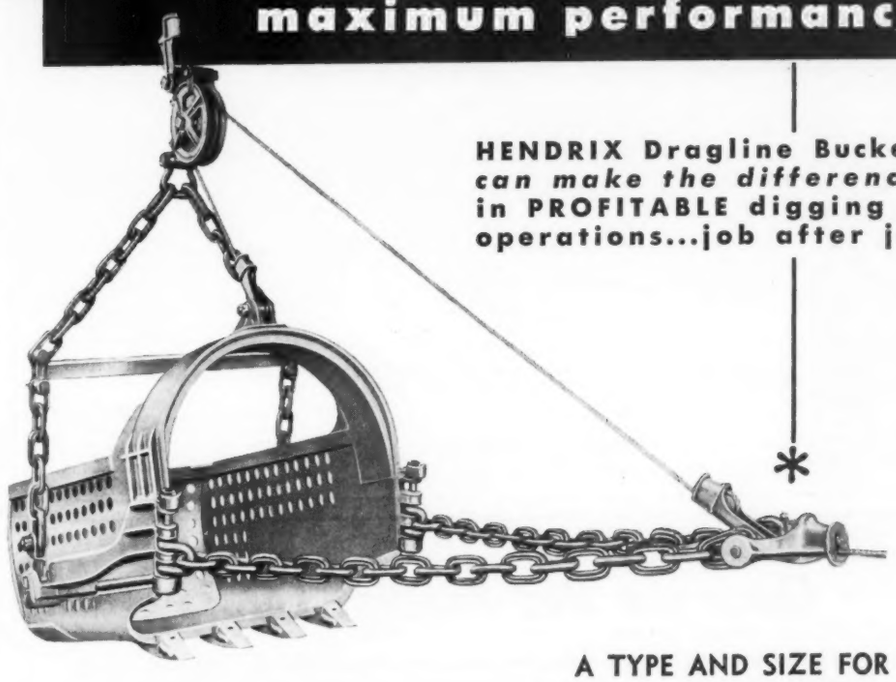
(Concluded on next page)

Dirt is cheap

but not to move

unless . . .

your equipment delivers maximum performance



HENDRIX Dragline Buckets *can make the difference* in PROFITABLE digging operations...job after job

A TYPE AND SIZE FOR EVERY DIGGING PURPOSE

¼ to 40 Cubic Yards

Hendrix Lightweight DRAGLINE BUCKETS

Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

(Continued from preceding page)

tone, 110 Atl. 2d 54, decided by the Appellate Division of the New Jersey Superior Court.)

The court said that an extension of the use to a 1-foot strip might have been so unsubstantial as not to violate the zoning ordinance, but that an extension to a strip 115 feet wide could not be regarded as unsubstantial.

Bond Did Not Permit Material Man to Sue

THE PROBLEM: *A pipeline-construction contract bound the contractor to promptly pay all labor and material claims and authorized the owner, a city, to retain a percentage of the contract price until all such claims were paid. The contractor's bond secured performance of the contract, but specified that only the city could sue on the bond. Could a material man sue the surety to collect for materials sold to the contractor?*

THE ANSWER: No. (Century Indemnity Co. v. Esso Standard Oil Co., 79 S. E. 2d 625, decided by the Virginia Supreme Court of Appeals.)

The court noted that the case was unlike one decided by the United States Circuit Court of Appeals, Fourth Circuit, where a paving contractor's bond guaranteed not only performance of the contract, but also payment of labor and material bills. (Daughtry v. Maryland Casualty Co., 48 Fed. 2d 786.) In that case it was decided that a material man could sue on the bond. Incidentally, the court said that "where neither the contract nor the bond provides for the payment of labor and materials claims, these are not protected, even though there be a statute requiring their protection."

Offsets on Claims for Contractor's Delay

THE PROBLEMS: *A contract for surfacing work on a government airport required the contractor to pay a daily sum for unnecessary delay in completing the job. (1) Various stop orders were issued but did not interfere with substantially normal prosecution of the work. Was the contractor entitled to credit for time spent in preparing to resume work after the orders were lifted? (2) Was he entitled to credit for delay due to priority problems involved in securing equipment and repair parts? He had made no complaint during the progress of the work, and government officials had done what they could to assist him in getting priorities.*

THE ANSWERS: (1) No. (2) No. (Palumbo v. United States, 113 Fed. Supp. 450, decided by the United States Court of Claims.)

Building Demolition

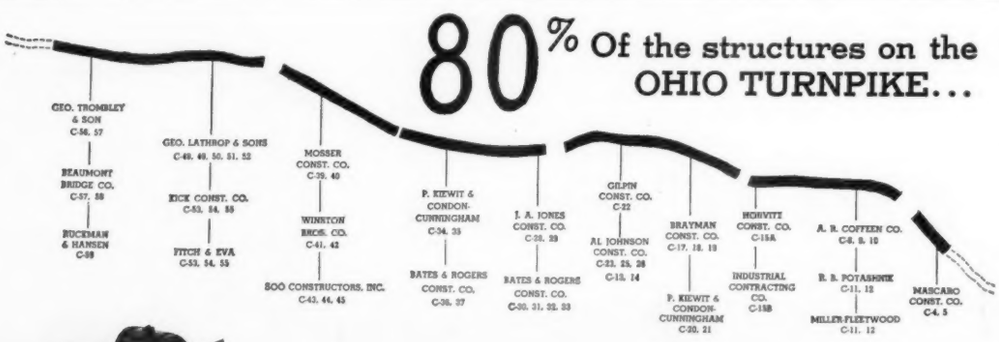
THE PROBLEM: *Is a demolition contractor liable to the owner of an adjacent building for damage to a party wall if he is not negligent in his work?*

THE ANSWER: No. (ABCD Corp. v. Henry, 109 Atl. 2d 133, decided by the Municipal Court of Appeals, District of Columbia.)

Gas Line Exploded

THE PROBLEM: *In excavating to relocate a gas line in a street, city employees should have known, if they did not know, that gas was escaping from an exposed gas pipe, the threads of which had been broken. The plaintiff, operator of a contractor's steam roller, was injured when a spark formed by the wheels spinning on the pavement ignited the gas, causing an explosion. Was the city liable in damages?*

THE ANSWER: Yes. (City of Memphis v. Uselton, 260 S. W. 2d 293, decided by the Tennessee Court of Appeals, Western Division.)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West Medford—Builders Equip. & Supplies, Inc.

Michigan
Detroit—Cyril J. Burke, Inc.
Grand Rapids—Don F. Nickel Equip. Co.

Minnesota
Minneapolis—Minneapolis Equip. Co.

Missouri
Kansas City—Machinery & Supplies Co., Inc.
St. Louis—Hennessey-Forrestal Machinery Co.

Montana
Helena—Montana Powder & Equip. Co.

New Jersey
Englewood—Contractors Supply Corp.

New York
Buffalo—G. W. Whitehead, Inc.
Freeport—Freeport Equip. Sales & Rentals, Inc.
Long Island City—Contractors Supply Corp.

Ohio
Cincinnati—Southern Gateway Co.
Cleveland—Day & Maddock Co.
Columbus—Lorenz Equipment Co.
Gallipolis—Bischoff Machinery Co.
Toledo—Howard T. Moriarty Co.

Oregon
Portland—Casey Tractor & Equip. Co.

Pennsylvania
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Utah
Salt Lake City—Western Machinery Co.

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Green Bay—Boehek Equipment Co.
Milwaukee—Boehek Equipment Co.

Canada
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Rotary Compressor Has Three Advanced Features

■ A folder on the new Worthington Blue Brute rotary portable air compressor describes three special features built into the machine. According to the literature, these features were requested by contractors during surveys made prior to designing the compressor.

For easier starts, the new Blue Brute compressor features a reliable clutch that allows the operator to warm up the engine before the compressor is engaged. In addition, the machine has a unique cylinder arrangement with full gravity-drainage of oil during shut down.

The third feature illustrated relates to accessibility for maintenance. It is emphasized that the design of the new compressor allows inspection without dismantling the entire compressor. The machine's fast blade-removal feature is also shown.

To obtain this literature write to the Worthington Corp., Holyoke, Mass., or use the Request Card at page 18. Circle No. 646.

Booklet on Roll Crushers

■ The Diamond line of roll crushers is shown in a booklet available on request. The literature lists specifications and dimensions for five sizes of crushers of the roller-bearing type and three sizes of the plain-bearing type.

There are also discussions of how the roll crusher works and factors to be considered in selecting the proper crusher for a given job.

To obtain Catalog D-5413 write to Diamond Iron Works, division of Goodman Mfg. Co., 4834 S. Halsted St., Chicago 9, Ill., or use the Request Card at page 18. Circle No. 680.

Check the Red Request Card!

For further information on the new equipment, new materials, and new literature described in this issue of Contractors and Engineers, check the item number on the Red Request Card bound in at page 18. No obligation, of course, and we will forward your request directly to the manufacturer.

Contractors and Engineers
470 Fourth Avenue, New York 16, N. Y.

This newly-developed rubber barricade readily gives way under impact.

Rubber Sawhorse Barricade Gives Way Under Impact

■ Built in the usual sawhorse shape with the conventional stripes, a new barricade made of rubber is practically indestructible. Credited with a life expectancy several times that of a wooden barricade, the rubber barricade bounces away on impact. It cannot splinter, and there are no sharp ends to punch or jab. The legs flatten out if the barricade is run over.

The barricade consists of three parts: a long bar with a set of legs at each end. The bar and legs are made of parallel strips of used tire fabric with strips of aluminum sandwiched in between. Spring-steel wires strengthen the bar but leave it flexible. It can be set up quickly on the job with the bar clamping securely in the niche formed when the legs are fastened.

The barricade is now being produced in several different color combinations to meet specifications of different state highway departments. It is available with or without a reflectorized surface for night visibility.

For further information write to Rubber Barricade Co., Inc., Carroll and Edwards Sts., Larned, Kans., or use the Request Card at page 18. Circle No. 651.

Precision Instruments for Surveyors and Engineers

■ The complete line of Gurley surveying and engineering instruments is covered by a newly revised catalog. Transits described include the Hell Gate precise transit, standard precise transit, telescopic solar transit; standard precise mining transit; and optoplane precise transit for industrial use.

The Gurley wye and dumpy levels, as well as standard and explorers alidades, plane table outfits, tripods, rods, current meters, water-level recorders, and other products are also featured.

To obtain Catalog 50 write to W. & L. E. Gurley, Troy, N. Y., or use the Request Card at page 18. Circle No. 660.

Galion Appoints Manager

Frank L. Hamilton has been appointed regional manager in charge of the Michigan, Ohio, western Pennsylvania, Kentucky, and West Virginia territory of the Galion Allsteel Body Co., Galion, Ohio.

In his new post, Mr. Hamilton will supervise sales of Galion dump bodies, hydraulic hoists, and Load-evator rear-end truck loaders. He will make his headquarters in Toledo, Ohio.

Folder on Breaker Balls And Drop Pile Hammers

■ Demolition balls, pile hammers, and crane-line weights are illustrated in literature from Eagle Iron Works, 150 Holcomb Ave., Des Moines, Iowa.

The breaker balls feature an arrangement by which a replacement hook can be installed easily in the field when the original hook fails.

The Eagle drop pile hammers and follow blocks shown are made in weights from 2,000 to 3,500 pounds in 250-pound increments. They are constructed to drive almost any commonly used wood or steel piling.

The crane-line weights illustrated feature a serrated cable groove that prevents slipping and cable damage.

To obtain Bulletin 252 write to the company, or use the Request Card at page 18. Circle No. 679.

M-R-S, Wooldridge Make Distribution Arrangement

M-R-S Mfg. Co., Flora, Miss., has completed arrangements with the Wooldridge Mfg. Co., Sunnyvale, Calif., which will make a complete line of Wooldridge cable scrapers available to M-R-S distributors. These scrapers, with capacities up to 30 yards struck, are designed to work with M-R-S tractors.

"Euc" Scrapers belong in your profit picture

Struck capacities of 7, 12, 15.5 and 18 cubic yards.

Profit-making features of Euclid Scrapers pay off in high production at low cost. Owners know from experience that they get more pay yards per hour with lower operating and maintenance cost, and that means low cost per yard.

They know, too, that "Euc" Scrapers have unequalled job availability because of their simple, rugged design and easy servicing. For example, there's no down time due to cable breakage because all scraper operations are lever actuated and independent . . . and the adjustable, long-life cutting blade with four identical and reversible sections assures peak production in all types of material from sand to sticky clay.

For performance and production data on work similar to yours, have your Euclid distributor provide helpful facts and figures on "Euc" Scrapers and see the new color movie, "Equation for Profit" that shows how "Eucs" can improve the profit picture on your earth moving work.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

EUCLID THE PIONEER

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

APPROVED for 1-course MACADAM
RUNWAY HIGHWAY CONSTRUCTION

The Vibro-Tamper applies vibration and impact, gives up to 95 proctor in 2 to 3 passes. Approved by many states and Army, Navy and CAA for 1-course construction.

In waterbound work, Vibro-Tamper "runs in" screenings in as few as 2 passes—saving 50% time on spreading, brooming, and rolling.

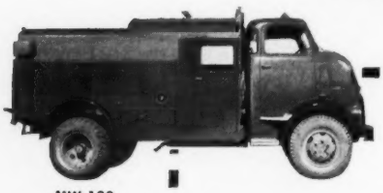
WRITE FOR VIBRO-TAMPER BULLETIN FOR COST-SAVING DETAILS

THE INTERNATIONAL VIBRATION COMPANY
16702 WATERLOO ROAD CLEVELAND 10, OHIO

HIGHWAY

LINE CONSTRUCTION AND MAINTENANCE EQUIPMENT

HC EARTH BORING MACHINE



MW-128 UTILITY TRUCK BODY

IU-76 INSTALLER'S UNIT

PWD-2 CABLE REEL TRAILER

Highway line construction and maintenance equipment — designed for safety, dependability, economy and long, trouble-free service life — the most completely engineered equipment available today.

That's the reason Highway equipment is more widely specified and used than *any other*. Highway's complete, experienced engineering service and extensive production facilities mean the right solution to *your* problems too! Call, wire or write for full information and specifications today.

HIGHWAY TRAILERS

HIGHWAY TRAILER COMPANY
HEADQUARTERS: EDGERTON, WISCONSIN

MANUFACTURERS OF:
Commercial Trailers • Trailerized Tanks and Dry Bulk Haulers • Public Utility Bodies • Earth Boring Machines • Pole and Cable Reel Trailers • Winches • Power Take-Offs • Service Accessories

SALES AND SERVICE IN PRINCIPAL CITIES

A General 307 dragline with Pettibone-Mulliken ¾-yard bucket loads an International R-190 truck as excavation and grading is carried on around the plant. This work was done under subcontract by R. H. Marlin, Indianapolis, Ind.
C&E Staff Photos

Plant keeps operating as additions are built

Paced by pile-driving crews which worked around the clock to keep out of the way of succeeding operations, workmen completed three major additions to a large auto-body plant in only nine months. The multimillion-dollar construction contract was awarded April 7, 1954, work started the next week, and the project was completed in January, 1955.

Construction included an addition to the press shop and increased storage and shipping facilities at the Grand Rapids, Mich., plant of the Fisher Body Division of General Motors Corp. General contractor for the project was Huber, Hunt & Nichols, Inc., Indianapolis, Ind.

Factors which greatly complicated construction were the location of the new additions on three sides of the old plant, together with the necessity of keeping the existing facilities in full operation during the construction period. Entrance roads carried a continuous stream of trucks hauling raw material and finished products to and from the plant, as well as trucks delivering material and supplies for construction. These roads and the rail sidings near the plant had to be kept unobstructed at all times. Utilities and fire-protection facilities also had to be maintained throughout construction.

Drive Foundation Piles

Except for the press shop, the buildings have a floor level at or above existing ground level. Little excavation was required other than that for footings. The press shop addition, which measures 150 × 360 feet, has a huge pit 16.5 feet deep for the foundations and lower parts of the huge presses which shape the body parts. This excavation as well as other grading on the site was done under a subcontract by R. H. Marlin, Indianapolis, Ind.

As soon as the excavation was down to grade, Raymond Concrete Pile Co.

. . . the new separable
FLEXCO HINGED BELT FASTENERS

U. S. Patent No. 2,477,855

- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts ⅜" to ½" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4608 Lexington St., Chicago 44, Ill.

New facilities completed in nine months; pile drivers work around the clock to drive 4,300 footing piles

moved a self-propelled pile-driving rig into the hole and started driving the shells for the 1,400 piles which support the presses. This rig worked 24 hours a day until these piles were driven. In the meantime a similar rig, also working around the clock, pounded away at the piles which support the several buildings. In all, 4,300 piles ranging in length from 24 to more than 50 feet were driven by these two machines in about a four-month period.

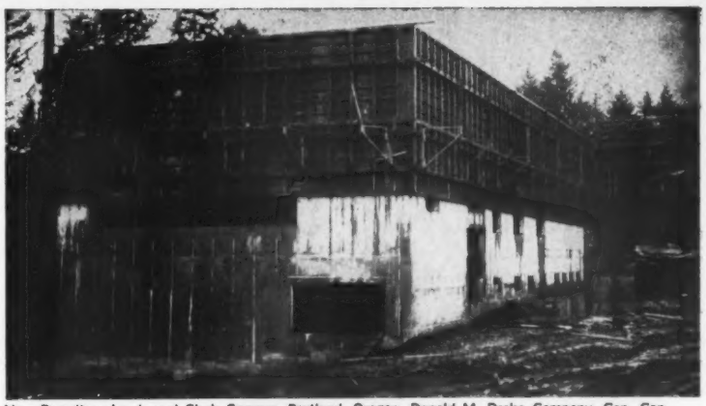
When the pile shells were driven and cut off to proper grade, they were filled with concrete which was chuted directly into the shells from ready-mix trucks. While the pile drivers were still at work, concrete crews prepared portions of the press pit and started placing the reinforced-concrete subfloor over the piles. A membrane waterproofing consisting of hot asphalt and glass fabric was applied over the 4-inch subfloor, and one inch of grout was poured over the membrane for protection.

A concrete slab 30 inches thick and reinforced with 1 to 1½-inch bars at 12-inch centers in both directions was then placed over the grout to carry the press loads to the piling. The big press girders which rest on piers on this concrete slab were set to within 1/64-inch tolerance. The necessity of maintaining this kind of tolerance during years of operation made the heavy foundation slab and the large number of bearing piles mandatory.

Walls of the press pit are of reinforced concrete 12 to 18 inches thick and are waterproofed on the outside. The superstructure of the building is a structural steel frame with walls of brick, sash, and corrugated-asbestos siding. The buildings are all one

(Continued on next page)

◄ Footing piles for the new metal-parts storage and shipping building at the auto-body plant are driven by a Raymond pile-driving rig as ready-mix concrete is chuted into a pile shell in the foreground.



New Dormitory Lewis and Clark Campus, Portland, Oregon, Donald M. Drake Company, Gen. Con.

Pouring Second Lift of High Wall with Symons Forms

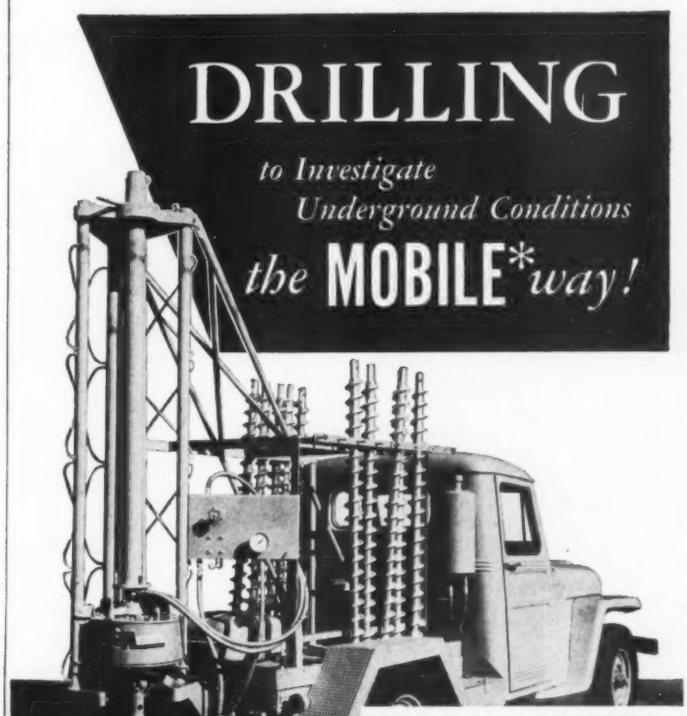
24′ wall poured in two lifts with Symons Forms. Scaffolding attached to forms makes easier setting and stripping of top forms. Note absence of bracing and minimum waling.

Send plans for your next job and get complete layout and cost sheet—no obligation. Catalog F-10 sent FREE upon request. Symons Clamp & Mfg. Co., 4251-D5, Diversey Avenue, Chicago 39, Illinois.

DRILLING

to Investigate Underground Conditions

the MOBILE* *way!*



There is a versatile, one-man Mobile Drill costing as little as $1,100. Available with hydraulic or hand feed.

. . . a few of the users of MOBILE DRILLS:

- *Arkansas Resources & Development Commission
- *Board of County Road Commissioners (Grand Rapids)
- *Delaware Geological Survey
- *S. J. Groves Constructions
- *Peter Kieweit and Sons
- *Moss-Thornton Company, Inc.
- *Western Contracting Co.
- *Williston Shell Rock Co.
- *80% of State Highway Departments.

There's nothing like a Mobile Drill—for low original cost—for versatility—and for maneuverability. Mounted on a Jeep or a 4-wheel-drive truck, the rugged, lightweight Mobile Drill can be transported over roughest terrain.

It's better to be safe—rather than sorry when making a bid. It costs so little with a Mobile Drill. Be sure—get your sub-soil information the Mobile Drill way! Write for full information—no cost or obligation.

World's Largest Manufacturer of Light Vehicle Powered Drills

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ROK·BITS® *at Monticello Dam*

The stripping operation, at this northern California dam site, is another important project where carbide Rok-Bits and Brunner & Lay drill steel were used—1⅝, 1¾, 1⅞ and 2-in. four-point Rok-Bits on Brunner & Lay 1¼″ round steel. Rok-Bits and B & L drill rods are specified everywhere by men who know their drilling cost. Join them! For details, write plant nearest you.

Carbide Rok-Bits—cross or chisel—gage sizes; 1¼" thru 4". Request Bulletin B-1.

Faces and names on the Monticello job—left to right—Geo. Keyes; Excavating Super.; Waldon Lowe; Paul Helton; Doug Baker, Gen'l Supt., Clarke Hestmark; Sherm Watson of Peter Kiewit Son's Co. & Parish Bros.

Brunner & Lay Products

Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill.
Brunner & Lay Rock Bit Corp., 2514 E. Cumberland St., Philadelphia 25, Pa.
Brunner & Lay Incorporated, 2425 East 37th St., Los Angeles 58, Calif.
Brunner & Lay, Inc., 150 Leslie St., Dallas, Texas
Brunner & Lay Rock Bit Corp., Sweeten Creek Rd., Asheville, N.C.
Brunner & Lay Corp., 600 N. Tillamook St., Portland 12, Ore.

A P&H truck crane with 55-foot boom and 20-foot jib raises a structural steel member into place. In the background may be seen the 100-foot boom and 21-foot jib of the Manitowoc 3500 crane which handled most of the heavy steel.

C&E Staff Photo

(Continued from preceding page)

story high and have an inside ceiling height of 41 feet.

Railroad Tracks Inside Building

On the opposite side of the old plant, an addition to the metal-parts storage and shipping area was constructed. This building is 1,617 feet long, 75 feet wide, and 41 feet high, and is supported on a combination of spread footings and piling. A railroad track runs through the entire length of the building in a track well 3.5 feet deep. This makes the building floor approximately level with the floor of a boxcar on the track. Another track which serves the boiler house lies just outside this building. This track, running about two-thirds the length of the new structure, had to be kept in service to provide for delivery of coal to the boiler house during the construction period.

Approximately two-thirds of the footings for this building are supported on Raymond concrete piles. The remainder are spread concrete footings resting on firm natural sand. Ready-mix concrete for these footings was placed by a Lorain 50-K crane using an Insley ¾-yard concrete bucket. Prefabricated column forms were tied with Symons column clamps. Concrete curtain walls were placed between the columns up to floor grade. Above that, the building consists of a structural steel superstructure covered with brick, sash, and asbestos sheathing.

Prefabricated form panels were used effectively to form concrete walls throughout the project. The panels were made up in 8-foot lengths and in widths of 8, 16, 18, and 24 inches. Forms were faced with ¾-inch Plyform backed with 2 × 4 studs running the short dimension of the panel and extending over both edges about four inches. Instead of being vertical, the studs were attached to the panels at a slight angle, and this permitted the overhanging ends to overlap when the panels were stacked one above the other.

In building a wall form with these panels, the contractor set the first section in place with Dayton snap ties at the required intervals along the top. The next panel was placed on the first, and a double 2 × 4 wale was placed behind the joint. The wale engaged the overhanging studs of both panels. The snap ties were fitted between the wales and locked in with wedge clamps. Except for those in a few outside braces, practically no nails were required to assemble the form. Stripping these forms was equally simple and resulted in very little damage being done to the panels.

Concrete for columns and wall sections, placed by the crane and bucket, was vibrated by Master vibrators.

The third major structure in the expansion project was an addition to the steel-storage building. This structure is 1,130 feet long, 75 feet wide, and 41 feet high to the bottom of the roof trusses. It is founded on Raymond piles which are capped with a concrete footing at grade. A railroad spur runs the length of this building and three large overhead cranes span the width of the structure to handle

Stop Effects of SHOCK!

Sinclair HEAVY DUTY BEARING GREASE is a greatly improved lubricant for bearings in power shovels, drag lines, tipples, conveyors and similar heavy duty equipment. It cuts wear by resisting shock, heavy loads, heat and pounding. It stays put – successfully lubricates large, loose-fitting bearings.

Sinclair GEAR PROTECTIVE COMPOUND provides a new high standard in exposed gear lubrication. Extreme pressure additives carry heavier loads – protect against wear. Moreover, this compound stays put, resists throw-off, squeeze-out or peeling.

Sinclair JET LUBRICANT #20 can prolong the working life of your turntables, rollers and roller rails. It is an all-season lubricant that resists squeeze-out – protects costly parts against shock and heavy, constant loads.

A Sinclair Lubrication Engineer can give you expert counsel on how you can get the most out of these cost cutting, time saving lubricants. Phone your local Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, New York.

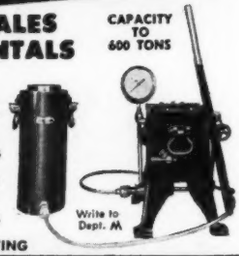
SINCLAIR LUBRICANTS

DUDGEON HYDRAULIC JACKS

SALES RENTALS

CAPACITY TO 600 TONS

FOR:
PILE TESTING
UNDER-PINNING
BRIDGES
PIPE PUSHING
SOIL TESTING



RICHARD DUDGEON INC. EST. 1850

789 BERGEN STREET BROOKLYN, N. Y.
• ST 9-4040 •

Concrete for the footings for the storage building, a 1,617 x 75-foot structure, is placed by a Lorain 50-K crane with an Insley ¾-yard bucket. Both spread concrete footings and piling support the building.

C&E Staff Photo

Combination Tool Heater And Asphalt Kettle

■ A single piece of equipment that heats 10 to 15 paving tools and also heats 45 gallons of asphalt binder at the same time is shown in literature from Aeroil Products Co., Inc., 69 Wesley St., South Hackensack, N. J.

The combination tool heater and asphalt kettle is particularly recommended for small repair work and for use by patch crews on patrol operation. The manufacturer reports that it is used extensively by townships, contractors, and works departments when large and more numerous pieces of equipment would be impractical.

The equipment, mounted on pneumatic wheels, is trailed behind light trucks.

To obtain Leaflet HE-T-1 write to the company, or use the Request Card that is bound in at page 18. Circle No. 730.

Booklet on New Trencher

■ A descriptive booklet is available on the Everett Model 60 trencher, which is reported to dig up to 5 feet deep as fast as 300 feet per hour. The booklet shows closeup views of the hydraulic drive on the trencher's conveyor, the belt slip clutch, the independent hydraulic system, and the bucket line. The operating benefits of the design of the trencher are illustrated in a sequence of cartoon drawings.

To obtain Bulletin 60 write to Earth Equipment Corp., 2036 Sacramento St., Los Angeles 21, Calif., or use the Request Card at page 18. Circle No. 635.

the heavy rolls and bundles of steel.

Structural Steel Work

Structural steel for the superstructures of all three major buildings was erected by the R. C. Mahon Co., Detroit, Mich. A Manitowoc 3500 crane with a 100-foot boom and 21-foot jib handled most of the heavy steel. Lighter members were set by a P&H truck crane with a 55-foot boom and 20-foot jib. The two cranes joined forces for some of the heavier sections. Riveting gangs using Chicago Pneumatic air compressors followed the erection gang.

Installation of the sprinkler system, one of the major subcontracts, was done by Phoenix Sprinkler & Heating Co., Grand Rapids. Large underground mains, laid completely around the outside of the plant, were connected to the city and county water system and to a large storage tank. Fire hydrants hooking into this system are located around the outside of the building. An automatic sprinkler system protects the entire area inside the buildings. This overhead system inside the structures consists of bulk mains, cross mains, and laterals with sprinklers.

Roads and Railroads

More than a half mile of paved road was constructed within the plant area under this contract. This pavement, designed for heavy truck loads, consists of an 8-inch reinforced-concrete slab on a compacted rock base 8 inches thick. Drain tile along the road gives assurance that the subgrade will stay dry.

The 1¾ miles of new railroad constructed under the contract was also built to high standards. Twelve inches of gravel ballast was placed on the carefully compacted grade. Treated wood ties support the 130-pound rails.

Payrolls were prepared in the field office for the crew. Altogether 450 or more workmen were on the job during several months of the construction.

Plans and specifications for the project, as well as job supervision, were provided by Argonaut Realty Division of General Motors. G. D. Mitten is manager of the division, which supervises all of General Motors' construction work. Harmon Hull was field superintendent in charge of this project. Huber, Hunt & Nichols was represented on the job by M. A. Evans, general superintendent; M. Pearcy, superintendent; and Clarence Jamison, field engineer. THE END

HERE'S HOW TO AVOID BEARING REPLACEMENT HEADACHES

says HY WHEELER, the sage of the socket wrench:

1. *Always* replace a Hyatt with another identical Hyatt.
2. Make sure shaft and housing bore seats are clean and smooth.
3. When pressing on inner races start bearings on shaft with rounded corner radius of race going first.
4. Direct the driving pressure straight and square, directly through race to be press fitted. Never hammer directly on races or rollers, and never use a wooden or soft metal mallet (chips or splinters may get into the bearing).
5. Use a lot of sharp quick taps instead of a few heavy ones; have straight square ends on driving accessories and fixtures, and drive races solidly up against shoulder of shaft or housing.
6. *Keep your hands and tools clean;* don't remove bearings from package until you're ready to use 'em—and most important of all, *be sure the package is the blue and yellow Hyatt box!* Remember, when it comes to *quality,*

there's no substitute for...

HYATT ROLLER BEARINGS

STRAIGHT BARREL TAPER

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

Ingenious forming pare ime,

Concrete is chuted from an Insley laydown bucket into 20-inch-diameter Sonotube paper forms to encase pilings for the Dauphin Island Bridge. The paper forms eliminate external curing and keep fresh concrete from exposure to sea water.

Two novel concrete-forming methods are being used to cut construction time and cost generally on the $3.5 million bridge across the Mississippi Sound from the Alabama coast to Dauphin Island. In one instance, paper forms are being used in placing concrete to encase the steel bearing piles below and above the water line. In the other, 34-foot reinforced-concrete roadway slabs are being precast in re-usable steel forms especially constructed on barges.

Blount Bros. Construction Co., Montgomery, Ala., and the Kansas City Bridge Co., Kansas City, Mo., are joint contractors on the job. The 4.4-mile structure, being built for the Alabama State Highway Department, will include 2.165 miles of steel and concrete bridge and a 210-foot lift span with a vertical clearance of 85 feet. The remainder of the structure is bulkhead fill and roadways across Sand Island and Little Dauphin Island, as well as on Dauphin Island and the Alabama mainland.

Construction of the bridge began with driving of the first piling about the middle of May, 1954. Completion is set for June 1 of this year.

Designed for H-15-44 AASHO loading, the roadway slabs are 29 feet wide and carry a 24-foot roadway, two 6-inch curbs, and two 2-foot sidewalks. The reinforced-concrete deck slabs—342 in all—are set on 23-foot 3-inch concrete caps which are 3 feet wide at the top, 2 feet wide at the bottom, and 2 feet deep. These caps are poured onto 4-pile bents of 10-inch 42-pound steel bearing piles reinforced with structural steel sway braces above the water line. Most of the steel piles, which are footed in sand, are 90 feet long, although some are as short as 81 feet. Four Vulcan and two McKiernan-Terry hammers were used in driving piles, with two Gardner-Denvers, two Joys, a Jaeger, and a Worthington compressor furnishing air.

Piling

The key to the piling-encasement operation is a job-developed air and water-jetting device which permits seating each concrete encasement 2 feet below the ground line, which var-

VACU-LUG *means* LOW *maintenance cost!* TOP QUALITY *performance!*

RELUG WITH VACU-LUG!

Vacu-Lug, the miracle process for renewing traction on worn tires, cuts tire maintenance in half. Yes, you save over half the cost of new tires, regardless of size when your worn ones are relugged by the famous Vacu-Lug Process.

Here is a proven method of traction restoration — tested and approved by U. S. Agr. Dept., laboratories, contractors, and municipalities. These new lugs are applied individually from crude rubber stock and are vulcanized to the tire in a huge steam chamber. What's more important, there is a shop near you ready to give instant service — to reduce down-time to a minimum.

Write for name of Vacu-Lug Shop nearest you.

Tears and breaks in the casing can be repaired at the same time the tires are being relugged. All repair and relugging work are completely guaranteed. Renew power loss — get Vacu-Lug now!

ON THE FARM OFF THE ROAD VACU-LUG PROCESS *Turns the Earth*

AMERICAN TIRE MACHINERY, INC.
MUNCIE, INDIANA

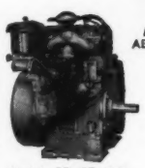
WISCONSIN-POWERED
New Pitman "Giraffe" Gives Men and Tools a Fast, **HIGH LIFT...**

With a reach up to 40 ft. above the ground and a lift capacity of 1500 lbs., this unique, folding type aerial boom, made by Pitman Mfg. Co., Kansas City, Mo., speeds up many overhead jobs in construction service. Can be used for hoisting men, tools and materials for roofing and similar work, drilling in quarries and construction jobs, working on power lines, setting light utility poles, placing transformers and similar operations.

A 2-cylinder Model TFD Wisconsin Heavy-Duty Air-Cooled engine supplies dependable, quick-starting, all-weather power which can also be used to drive compressor or generator . . . again demonstrating the great versatility and adaptability of Wisconsin Engines . . . providing always ready-to-go Lugging Power to Fit the Job and the Machine . . . 4-cycle single cylinder, 2- and 4-cylinder models 3 to 36 hp.

You can't do better than specify "Wisconsin Power" for *your* equipment. Write for Bulletin S-164.

Models ABN, AKN, AEN, 4-cy. single cyl., 3 to 8¼ hp.



Models TE, TF, TFD 2-cylinder, 7 to 15 hp.

Models VE4, VF4, and VG4D, V-type 4-cyl., 15 to 36 hp.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

A 8228-½IA

...time, cost on bridge job

Paper tubes are used in encasing piles with concrete, while deck slabs are precast in barge-mounted forms

ies from 1 to 16 feet below the water line. Development of this device made it efficient and economical to use 20-inch-diameter circular casements rather than the standard 16-inch square encasements.

Sonotube paper forms were fitted with wooden bottoms shaped to fit the H-shaped piling. The form was then set in a jetting cage which extended 2 feet below the bottom of the tube and was equipped with six jets. The ground line was sounded and the jetting cage, Sonotube, and reinforcing spiral slipped over the upper end of the piling.

Encasement concrete pouring begins with the bottom of the Sonotube just above the water line, and the weight of additional concrete carries the device to the bottom as pouring continues. As a result, all concrete is placed in the dry. A mandrel trips the jetting cage as it reaches the ground line, and when the full encasement —its length predetermined by the sounding — has been placed it is topped off one foot above the water line. Then the jetting cage is recovered.

The presence of the sway braces makes it more efficient to pour the remaining part of the encasing concrete as a second operation. The Sonotubes must be slit and notched to fit these sway braces. The paper tubes are easily cut with an electric circular hand saw, fitted over the sway bracing and clamped with 1¼-inch iron rachet-type column clamps. Concrete is placed to within one foot of the top of the piling and is handled by cranes from concrete barges.

Particular advantages of the Sonotube forms are that they eliminate external curing and keep the fresh concrete from exposure to sea water.

Deck Slabs

Development of the barge-mounted forms into which truck-mixed concrete is placed for the deck slabs was worked out by the contractor and representatives of Irvington Form & Tank Corp., New York, N. Y., who built the 10-gage sheet-steel forms. Use of these ingenious forms eliminated the problems of setting up a casting yard, casting in forms on

(Continued on next page)

A Lorain crane with 1-cubic-yard bucket places concrete in a roadway slab form mounted on a barge in the Mobile, Ala., harbor. At lower right, a truck mixer takes on a load of concrete from the batch plant for the short haul to the pour.

Erects itself . . . completely set up in only 23 minutes.
Pay only one man instead of 5
Tow it right to the jobsite.
Ready-rigged tower unfolds like a jack-knife.

...with BUCK Heavy-Duty Hoisting Machine

Save profits for yourself. Instead of hiring four or five men to set up hoisting operations, use only *one* . . . and the BUCK Hoisting Machine.

BUCK erects itself, works itself, lowers itself . . . lifts full ton of materials to any desired level. Tower is self-erecting to 40 ft. unloading height . . . can be used with easy-to-add sections for greater height. Automatically retracting wheels eliminate heavy lifting, skidding and jacking. Self-dumping concrete bucket and Chicago boom available as accessories.

Get better acquainted with BUCK. Write for all the money-saving facts today.

Some desirable territories open to dealers . . . write for details.

BUCK EQUIPMENT CORP.
208 BUTLER ST., CINCINNATI 2, OHIO

Saves 6 men, 4 tampers, 2 compressors and small dozer with one-man-operated "80-W"

VAN DOREN BROTHERS of Richmond, Virginia recently backfilled and compacted approximately two miles of trench, 2 feet wide and 4 feet deep, for a 6-inch gas line with just one man and one machine, a Cleveland "80-W" backfiller.

Before the Van Dorens purchased their "80-W" they used 7 men, a rubber-tired dozer, 2 compressors and 4 air-driven tampers for backfilling and compacting on jobs of similar size and type. The one-man-operated "80-W" did the complete job in less time than the 7-man crew formerly required on comparable jobs. "It's a great time saver," was F. M. Van Doren's comment on its performance.

On a previous job their Cleveland backfiller had saved them considerable time and money on a 12-inch water line trench, averaging approximately 6 feet deep, by its unique ability to backfill spoil deposited on a down slope on the far side of the trench, while simultaneously tamping it to the state of Virginia's rigid compaction specifications.

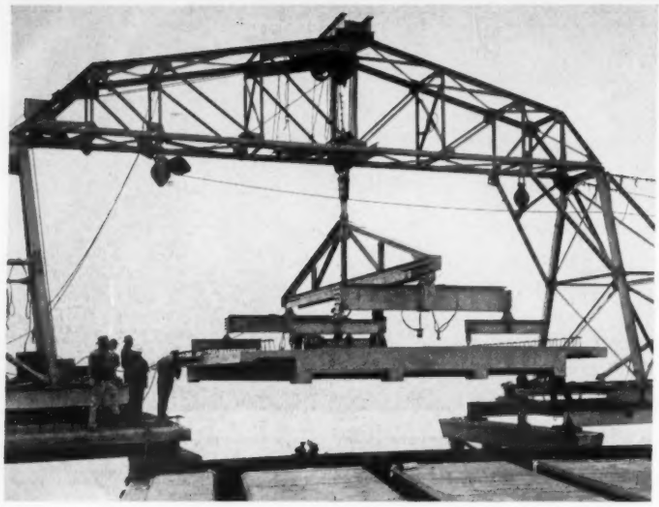
The "80-W" also does an outstanding job of side-crane work, lays pipe, pulls crossings, sets hydrants and valves, pulls sheathing, loads and unloads pipe, etc. Despite its ability to perform all these operations — and do an outstanding job on *each* of them — the "80-W" is easy to operate. The Van Dorens' operator learned to operate it with high efficiency after only two days training on the job.

Investigate this remarkable time, labor and machinery saving tool now—so that you, too, can realize its outstanding benefits on your next job.

See your local distributor for the full Cleveland story or write direct to:

THE CLEVELAND TRENCHER COMPANY • 20100 St. Clair Ave., Cleveland 17, Ohio

CLEVELAND



This traveler equipped with Skagit G-70 hoist has just lifted a 65-ton precast-concrete deck slab from the barge (bottom) and will place it in the opening between bridge sections.

(Continued from preceding page)

shore, and lifting the slabs onto barges for delivery to the site. On the other hand, it did away with the hazards of pouring in place over an open stretch of Gulf water intermittently tossed by sudden and severe blows and storms.

Six barges are used on this phase of the job, and three of the 29×34-foot 65-ton slabs are cast on each barge. Radcliff Gravel Co., Inc., Mobile, Ala., is casting the slabs at its Mobile waterfront plant, 27 miles from the bridge site. Radcliff's total quantity on this job will be approximately 9,900 cubic yards of concrete.

Radcliff's truck mixers make an extremely short run—about 75 feet—from the Binanbatch concrete-batching plants to the dockside, with a 4 to 6-minute interval for mixing. A Lorain 820 crane handles the 1-cubic-yard Insley laydown bucket between the trucks and the barges.

Steel reinforcing for the slabs is tied into cages in special false forms on the bank of the river, and a Bucyrus-Erie 38-B crane lifts the entire cage from the false form and lowers it onto the barge. The barges are then towed to the Radcliff plant for the pour.

Slabs are screeded, belted, and cured with Hunt Clear Cure.

The concrete mix design specified by the Alabama State Highway Department calls for the following proportions per cubic yard: 541 pounds of Ideal Type II cement, 135 pounds of fly ash, 3 per cent entrained air, 38.9 gallons of water, 1,094 pounds of sand, and 1,728 pounds of gravel. Use of locally produced fly ash as a cement replacement by the state highway department has represented both savings in construction cost and a means toward developing a concrete highly resistant to sea water.

At the bridge site, a slab-placing traveler, designed especially for the project and equipped with a Skagit G-70 hoist, travels on its own tracks as the bridge grows. The rig reaches down between the pile bents and connects its lifting beams to eight lifting eyes screwed into coil anchors cast in the slab. All these lifting devices are supplied by Superior Concrete Accessories, Inc.

Just before the hoist takes the load, air pressure is applied through large-diameter hoses placed under the soffits. This pressure breaks the bond and pops the slab loose from the form. The hoist then lifts the slab above the level of the bridge roadway, revolves it through 90 degrees, and lowers it into place on the concrete caps. Because of this method of placing the slabs, it is possible to get

How TIMKEN® bearings help reduce cable wear in Bucyrus-Erie walking dragline

WHEN this big 1250-B Bucyrus-Erie dragline drags, hoists, swings, and dumps, there's plenty of stress on the boom point sheaves. To keep them operating trouble-free and prevent excessive cable wear, they're mounted on Timken® tapered roller bearings.

Each of the two sheaves in the swivel yoke is mounted on a pair of Timken bearings. Because of their tapered construction, Timken bearings take radial and thrust loads in any combination.

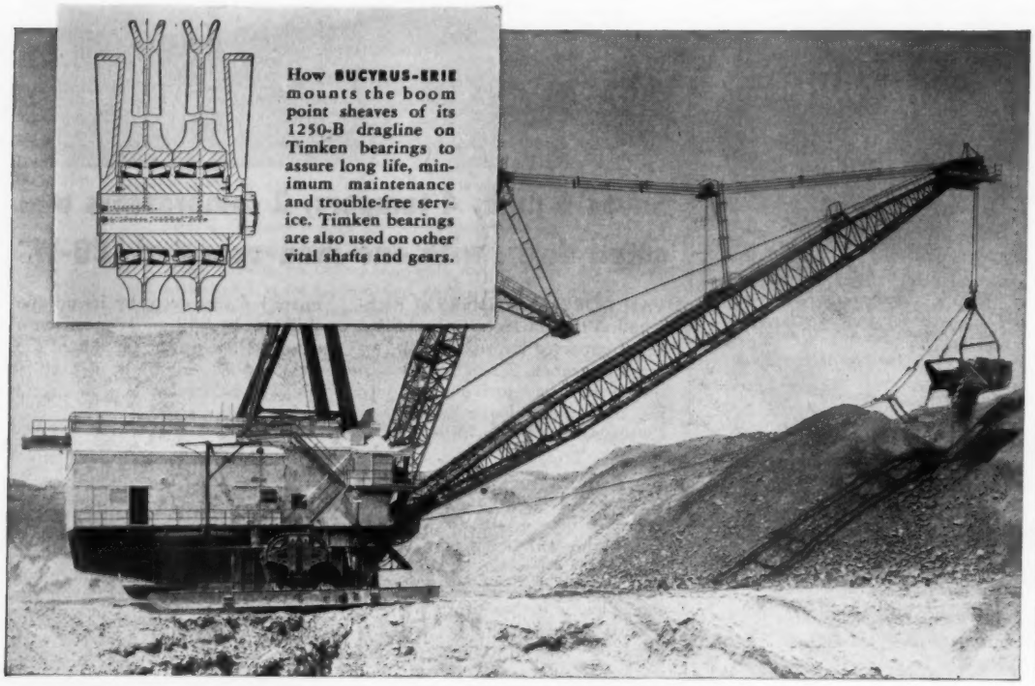
There's less wear caused by the cable slipping on the sheaves, too. The true rolling motion and incredibly smooth surface finish of Timken bearings practically eliminate friction.

There's no danger of the sheaves not standing up to occasional overloads because wide line contact between rollers and races gives Timken bearings load-carrying capacity to spare.

Even sudden jerks caused by cable slack during the drag operation don't affect Timken bearings in the boom point sheaves. Rollers and races of Timken bearings are case-hardened to give them hard, wear-resistant surfaces over tough, shock-resistant cores.

To get dependability like this in the equipment you build or buy, always look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian Plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **BUCYRUS-ERIE** mounts the boom point sheaves of its 1250-B dragline on Timken bearings to assure long life, minimum maintenance and trouble-free service. Timken bearings are also used on other vital shafts and gears.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

WE MAKE OUR OWN STEEL

The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

NOT JUST A BALL ◯ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST ◫ LOADS OR ANY COMBINATION

Get 4 BIG ADVANTAGES

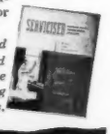
with Servicised

White Pigmented Concrete Curing Compounds

1. Fast, positive coverage... no missed spots
2. Reflects heat—reduces concrete temperatures 15° F.
3. Saves material... no waste or overlap
4. Does not run on sloping surfaces—"stays put" after application

Servicised White Pigmented Curing Compound is widely used in areas where atmospheric temperatures exceed 80° F. because it produces a membrane capable of reflecting heat to reduce concrete temperatures as much as 15° F. Even application, using minimum material and application time. May be sprayed or brushed.

Write for complete details and circular on Servicised Concrete Curing Compounds.



SERVICISED PRODUCTS CORPORATION
6051 West 65th Street, Chicago, Illinois

the barges between the bents, which are 34 feet apart.

First one end slab, then the other, and finally the middle slab—in that order—is lifted from the barge, so that the carrier remains as nearly level as possible during the lifting operation. The average time for lifting and setting a slab in place is 50 minutes, including drilling holes and placing dowel pins into the caps on the fixed end of each slab. Curbs are placed after the slabs are in position.

The form cleanup starts as soon as a slab is lifted out of the barge at the bridge site. Turn-around time for a barge is about 9 days. The slabs are set in place 5 to 6 days after being cast.

A large spread of heavy equipment was brought in by Blount and Kansas City Bridge for this project. Cranes include two Wiley 35-ton floating Whirleys, three Bucyrus-Erie 38-B's and one 22-B, three Lorains, a Northwest, and a Link-Belt. An International TD-14, a Caterpillar D6, and at Cat D4 are used on grading and dozing operations. Three Winslow Binanbatch setups prepare concrete for the truck mixers. Communication is maintained by means of a Motorola two-way radio network connecting tugs, offices, and other strategic points. Portable sets are also used for isolated operations.

An excellent safety record has been achieved on the job, considering the large labor force (more than 300 workers) and the diversified work on the 4-mile-long job. Life jackets and hard hats are required equipment.

Other Phases

The lift span over the Intracoastal Waterway through Passe Aux Herons will be built by American Bridge to allow a horizontal clearance of 200 feet. The structural steel lift span towers rest on 9-foot 3-inch × 28-foot steel caissons filled with concrete, and conventional bridge piers. Each caisson has nine 42-pound 10-inch bearing piles, and each pier footing has 36 such steel bearing piles.

The bridge railing will be Armco Flex-Beam hand rail with structural steel posts bolted to the outside of the spans. Parking ramps are provided on each side of the lift span, with the roadway slab adjacent to these ramps being of special design and poured in place.

Fill material for the timber bulkhead and open roadway section is provided from sand and shell dredged from designated borrow areas. A 10-inch hydraulic dredge was used in this operation.

Personnel

The Dauphin Island Bridge will connect the southernmost end of State Route 163 at Cedar Point with Dauphin Island,which is being developed as a resort area. The bridge was designed by the Alabama State Highway Department, of which John W. Chambers is chief bridge design engineer. Fred A. Robison is in charge of the state department's control and inspection staff at the site. W. G. Pruett is highway director for the State of Alabama.

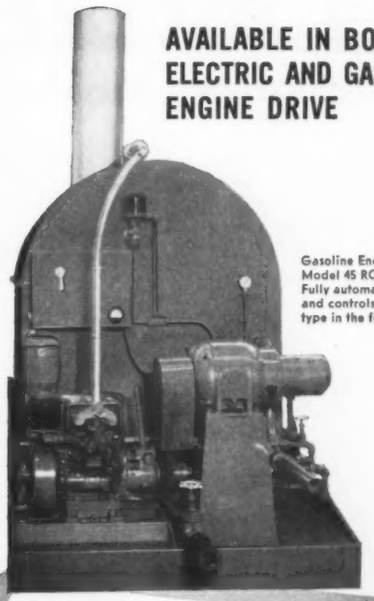
General superintendent of construction for Blount Bros.-Kansas City Bridge is Frank W. Currey. Russell Thompson is field superintendent, W. D. Tryon is project engineer, and H. H. Naylor is superintendent of slab casting. THE END

THE ENGLER dc Hour Log, a timing instrument that registers hours and minutes of engine operation, has put equipment maintenance on a more reliable basis than before. The instrument can be installed on tractors, graders, cranes, or on any other kind of equipment powered by an electric motor or gasoline or diesel engine. The extreme right figure roll represents 1/10 of an hour or 6 minutes, and the other figure rolls register hours of operation. The instrument is sealed in an aluminum case. For further information write to Engler Instrument Co., 250 Culver Ave., Jersey City, N. J., or use the Request Card at page 18. Circle No. 687.

HY-WAY
Announces
THE NEW
"RC"
MODELS

YOUR CHOICE OF GAS, LIGHT OIL OR HEAVY OIL BURNING EQUIPMENT

AVAILABLE IN BOTH ELECTRIC AND GASOLINE ENGINE DRIVE



Gasoline Engine Drive
Model 45 RCG
Fully automatic burner and controls. First of its type in the field.

Hy-Way—first and foremost in hot oil heating—now offers two brand-new units . . . the "RC" Series . . . designed for increased efficiency, lower operating cost, and minimum maintenance. Standard features on all models include:

- New Open Wiring Electrical Panel.
- Wet Plate Baffle—Exclusive Hy-Way Design.
- Fully Insulated.
- Portable.
- Skid-Mounted.
- Fully Automatic Controls and Equipment.
- BTU Rating Output—1 Million to 4 Million.
- Width 5' 4"—Length 13'—Height 6' 6".

Hy-Way Heaters are used throughout the world—from Saudi Arabia to Greenland. Write today for complete details and free literature.

HOT OIL HEATING
RUST
FREEZE
HI-PRESSURE
HY-WAY HEAT SYSTEMS INC.

HY-WAY HEAT SYSTEMS, INC.
BOX 2494 • YOUNGSTOWN 9, OHIO

Bridge Pads Absorb Vibration and Impact

■ Preformed fabric pads used on bridges for bridge seats, expansion joints, and guardrail and lamp-base mountings are described in literature from Fabreeka Products Co., Inc., 222 Summer St., Boston 10, Mass. Fabreeka pads are used in these installations to distribute loadings and to compensate for irregularities of bearing surfaces. They prevent chipping and flaking of concrete and grout, and seal out moisture and dirt. Having shock-absorbing characteristics, they reduce the transmission of impact shock.

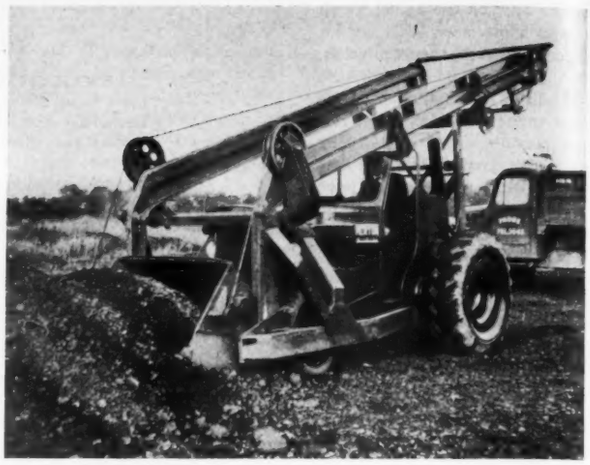
The Fabreeka highway bridge pads will withstand loads up to 11,000 psi. They are furnished cut to size with bolt holes as specified, and are simply dropped over the anchor bolts in installation. Unaffected by adverse weather conditions, they require no painting.

The manufacturer reports that the pads were recently approved by the American Association of State Highway Officials.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 701.

Leschen Appointment

The Michigan sales area of Leschen Wire Rope Division, H. K. Porter Co., Inc., St. Louis, Mo., a territory covering the lower Michigan peninsula and part of the upper peninsula, has been given to Fred S. Shumaker, the new district representative. Mr. Shumaker has been with distributors selling wire rope to contractors in the Detroit area for the past 13 years.



The Merton Overloader.

Loader Has Bucket That Rides Overhead on Rails For Straight-Line Loading Without Maneuvering

■ A newly-imported overhead tractor-loader that operates on the straight-line loading principle completes the entire load-discharge cycle in 15 to 20 seconds. Equipped with a bucket that runs on overhead rails, the Merton Overloader can discharge its load into a truck directly behind it without the usual maneuvering required with conventional front-end loaders. The machine is powered by a Fordson Major 4-cylinder diesel engine developing 44 bhp at 1,700 rpm.

The unit's ¾-yard bucket is operated by means of winches and cables controlled by one lever which operates both the winch drive clutch and the winch brakes. The drive to the winches is taken from the front of the engine, and is therefore completely independent of the master clutch. The uninterrupted winch drive, allowing independent control of the traveling and bucket motions, affords extra crowding action.

The digging depth of the bucket can be adjusted to any position between 2 inches above ground level and 4 inches below ground level. A shaking action of the bucket helps to discharge sticky material.

The discharge height of the Merton Overloader is variable. A small hand-operated winch raises and lowers the overhead structure of the machine by extending and retracting telescopic supports at the rear of the machine. In this fashion, the bucket can discharge at any height from a minimum of 6 feet 11 inches to a maximum of 11 feet 2 inches.

The maximum reach of the bucket is 3 feet 6 inches, and 2 feet at the highest discharge position. Turning radius is 17 feet 6 inches.

A light materials bucket of 1-cubic-yard-capacity is available for the unit. Other optional equipment includes a 6-foot 9-inch bulldozer blade and a one-ton-capacity crane-hook attachment.

Seaboard Equipment Co., 7 Hanover St., New York, N. Y., is the exclusive sales representative for the Merton Overloader in the U. S. and Canada. For further details write to this concern, or use the Request Card at page 18. Circle No. 664.

NEW...as 1955!

Revolutionary Mason Scaffold

...the SAFWAY

MOBIL-BRACKET

Lifts Platform to Follow Work; Can be Used with any Safway Scaffolding at any Height

NOW, for the first time, masons can set their own best working height! The Safway MOBIL-BRACKET "climbs" the scaffold as walls rise. It gives you all Safway Scaffolding advantages plus adjustable material and loading platforms.

IT'S SAFE! IT'S FAST! IT SAVES!

And you can *buy* or *rent* MOBIL-BRACKETS from the Safway distributor in your area!

LET US DEMONSTRATE OR WRITE FOR FREE LITERATURE!

SAFWAY STEEL PRODUCTS INCORPORATED 6240 West State St. MILWAUKEE 13, WIS.

Manufacturers of Tubular Steel Scaffolding and Equipment

RENTED and SOLD by distributors everywhere

MULLER MIXERS *and* POWER TROWELS *set quality standards in their fields*

Muller's earliest objective—to make the best possible plaster and mortar mixer and sell it for the lowest possible price—was achieved by: (1) specialization on a few models . . . (2) careful selection of materials and components . . . (3) experienced workmanship . . . (4) sound distribution methods. Other Muller Machines, also, rank high in their fields for the same reasons.

PLASTER AND MORTAR MIXERS

Made in 2, 3½, 6, 6 to 8, and 9 cu. ft. sizes. Electric motor or gas engine power. All models have Muller Lifetime Paddle Shaft Seal to protect bearings. Power throwouts on smaller models, built-in disc clutch on larger. Many other features. Priced $180 to $996 FOB Factory. Rubber scraper blades are available for all sizes.

CONCRETE MIXERS

3 models, 3 to 6 cu. ft. capacities, tilting type. Ample size drums, fast mixing action, Timken Bearings, electrically welded, sturdy construction throughout. Power—electric motor or Briggs & Stratton Air Cooled Engines. Prices $230 to $660, FOB Factory.

POWER TROWELS

2 sizes—29" diameter, 1¾ HP; and 34", 2¼ HP Briggs & Stratton Engines. Stationary guide ring eliminates hand troweling when finishing along baseboard. Engine speed regulated by governor control on handle.

SEND FOR INFORMATION FOLDERS AND NAME OF LOCAL DEALER

MULLER MACHINERY COMPANY, Inc. Matuchen 15, New Jersey Cable Address, MULMIX

Highly portable, this new Austin-Western single-pass crushing plant features push-button electric control of all components except the crusher.

Diesel-Electric Powered Portable Crushing Plant

■ A newly-designed single-pass diesel-electric portable crushing plant has been announced by Baldwin-Lima-Hamilton Corp., Construction Equipment Division, Lima, Ohio. Capable of producing two sizes of material, the Austin-Western plant has good application on jobs requiring high portability.

The plant also offers easy operation, with all components except the crusher driven by individual electric motors controlled by push buttons from the operator's platform. Because the design of the plant eliminates chains, idlers, sprockets, and clutches, it also offers economical operation and maintenance.

The plant, which can also be furnished with straight mechanical drive, weighs approximately 20,000 pounds. Components are a loading hopper with grizzly, mechanical feeder, a 2×6 double-deck inclined gyrating screen, 1024 roller-bearing jaw crusher, 24-inch × 27-foot delivery conveyor, and an 18-inch × 20-foot sand reject conveyor. The sand conveyor can be operated on either side of the plant, eliminating the need for support horses.

Mounted on a rugged steel frame that has rear dual tires for greater stability, the plant requires a 45-hp gasoline or diesel engine.

For further information write to the company, or use the Request Card at page 18. Circle No. 653.

Highway Scales By-Pass Legally Loaded Vehicles, Cutting Down Delays at the Weighing Station

■ Literature on truck-axle overload detectors designed to instantaneously signal an excessively loaded single or tandem axle while the truck is in motion is available from Cox & Stevens Electronic Scales, Division of Revere Corp. of America, Wallingford, Conn. The detectors operate in conjunction with a short recessed platform in the highway.

Used with a weighing station, the detectors will permit all legally loaded vehicles to pass the station and will divert all excessively loaded vehicles into the station for weighing. The load settings in the detector units are easily adjusted to any legal limit.

The literature describes the operation and installation of the units.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 691.

Equipment Depreciation Under the 1954 Code

■ To help owners of construction equipment take advantage of the liberalized depreciation allowances permitted by the Internal Revenue Code of 1954, The Jaeger Machine Co., Columbus 16, Ohio, has compiled a new booklet entitled "New Methods of Depreciation for Contractors."

The booklet shows the various methods of computing depreciation, their relative advantages and limitations, as well as typical examples and comparisons. It shows how depreciation of a larger amount of capital invested in equipment during the earlier years of its useful life enables the owner to reinvest his capital at a more appropriate time in new equipment.

It is pointed out that by taking advantage of the new Code, companies in the construction business can, at relatively low cost, have the most modern labor-saving machines available for profitable operations without investing additional cash.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 734.

LeTourneau-Westinghouse Sales Representative

Southern New York, eastern Pennsylvania, New Jersey, Maryland, and Delaware are being served by a new district sales representative for LeTourneau-Westinghouse Co., Steve A. Batorson. Mr. Batorson makes his headquarters in Philadelphia, Pa.

He has been with the company for more than ten years, and has had wide experience in field engineering, sales field work, and market research.

OVERMAN STONE AND BITUMINOUS SPREADER

THEY USE 'EM EVERYWHERE!

. . . IN NEW YORK—Buffalo Municipal Airport runways were resurfaced quickly and economically. The contractor, George Roetzer, now a dealer for Overman Spreader, says,

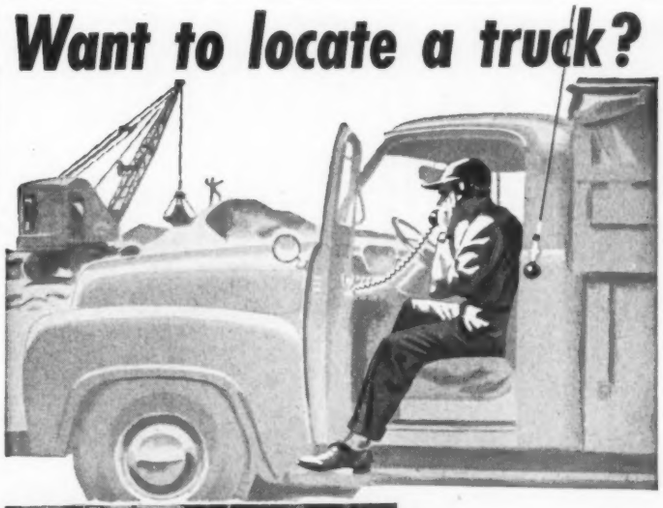
"I have used the Model 810 during the past year and can say that it is the best spreader in the low-priced field. I spread both No. 3 and 4 stone, bankrun gravel, and sheet asphalt. We put 975 tons of No. 3 stone thru this spreader in six and one-half hours. We spread 490 tons of asphalt in seven hours. We put approximately 72,000 tons of material thru this spreader during 1954. It is a light machine which can be towed by a Ford truck and on a soft base."

We know that you, too, will be enthusiastic at its performance.

WRITE FOR BULLETIN TODAY

I. J. Overman Mfg. Co.
BOX 203 MARION, IND.

Want to locate a truck?



Find it FAST . . . with RCA 2-Way Radio

—says Irvin R. Worthington
Burlington County (N. J.),
Road Supervisor

"Our 11 trucks are on the go most of the time," says Mr. Worthington. "But with radio I can contact any of them on a moment's notice.

"We cover 500 highway miles in good weather or bad, and each truck is on call every minute of the day. In any emergency—in case of breakdowns—drivers report in by radio, and we change dispatching instructions without a minute's delay."

• • •

"To figure savings," says Mr. Worthington, "I just total the number of times we've rerouted an extra batch of concrete, eliminated cruising between jobs, gotten emergency crews out in a hurry—and I estimate we've increased our efficiency 50%."

Do It BEST with RCA 2-Way Radio. EASY TO USE as your telephone • COMPACT—takes no more space than a spare tire • TOUGH—constructed to take rough field conditions • RELIABLE—engineered by the leaders in electronics • PRACTICAL—installation and maintenance available from RCA Service Company.

FOR INFORMATION MAIL COUPON NOW

Communications Division, Radio Corporation of America
Dept. P-277, Building 15-1, Camden, N. J.
☐ Please send me information on RCA 2-Way Radio
☐ Please have a representative call on me

Name_____ Title_____

Company_____ Address_____

City_____ Zone____ State_____

RCA RADIO CORPORATION of AMERICA
COMMUNICATIONS EQUIPMENT CAMDEN, N. J.

A Koehring 503 shovel loads an International L-190 truck as the new roadway is brought to grade. The old road in the background is maintained for through traffic.

C&E Staff Photo

Concrete pavement laid for divided highway

By leaving the existing highway in service while a new grade and pavement were built adjacent to the old road, J. R. Griffith Co., Inc., Racine, Wis., avoided the necessity of making a detour for through traffic. But this —though it solved one difficulty for the contractor—created another problem. Since material trucks and construction machinery had to mingle with vehicular traffic at many points throughout the 10.5-mile job, automobiles and trucks had to be slowed to provide safe operating conditions for crews and equipment.

Speed limit signs, warning signs, flashing lights, and flagmen helped to slow traffic to a great extent. Results were not completely satisfactory, however, until Griffith hired a special deputy sheriff to patrol the highway through the construction area. After word of a few arrests got around, job conditions on the highway stretch were much improved.

Despite the traffic complications and a very rainy working season, the $1,100,000 project on U. S. 41 and 141 north of Green Bay, Wis., was substantially completed by last November. The new pavement lies just west of the existing road and will eventually be the northbound roadway of a divided highway. The finished roadway is a 24-foot concrete pavement, 9 inches thick, laid over a 7-inch compacted gravel base and 5 inches of sand and subbase. On each side are 10-foot shoulders. The new alignment was so close to the old road, however, that the east shoulder and ditch section had to be finished after the new pavement was opened to traffic. In several areas where a deep cut was required to straighten the grade, there was not even room between the new and old roads for a slope to support the old pavement.

Strip Topsoil With Draglines

Clearing and grubbing crews using McCulloch chain saws and Caterpillar and International tractors with dozers started clearing the right-of-way early in the summer. Two draglines, a Manitowoc 2000B and a Koehring 503, followed the grubbing crew to strip topsoil and muck out swampy areas. A Caterpillar D7 equipped with an end loader and a 2½-yard bucket also helped with the stripping. Topsoil was stockpiled for finishing, and unsuitable materials were cast or hauled to waste dumps.

A fleet of tractor-drawn and self-propelled scrapers then started moving the 400,000 cubic yards of excavation required to build the new grade. There were nine LeTourneau and Wooldridge scrapers drawn by Caterpillar D8 and International TD-24 tractors, and four Tournapulls—one Super C and three C Tournamatics. A Cat D8, an Allis-Chalmers HD-20, and an International TD-24 push-loaded the scrapers in the loading areas. Caterpillar D6, D7, and D8 tractor-dozers leveled the material as it was dumped and shaped the roadway section. The Koehring 503 dragline was converted to a shovel and used in the deeper cuts, some of which ranged up to 15 feet. The shovel loaded the material into trucks which hauled to some of the more distant fill areas.

Wet material caused a great deal of delay in the grading operations.

"Our TD-9 Skid-Shovel Saves 20 Gallons of Fuel Daily"

CHARGING THE HOPPER at the rate of 125 yards hourly is just one job the TD-9 INTERNATIONAL DROTT Skid-Shovel handles so fast and efficiently. It also strips overburden and loads crushed gravel into haul trucks.

Gravel plant owner makes big equipment savings, too, replacing bigger crawler-dozer with INTERNATIONAL DROTT loader

Ray Garrett, gravel plant owner at Montrose, South Dakota, cut his equipment investment and fuel bill by putting a 41-horsepower TD-9 INTERNATIONAL DROTT Skid-Shovel to work on his materials handling.

Here's Ray's own report on his double-barreled savings:

"We feed up to 125 yards of gravel into the crusher hourly. A larger crawler and dozer used to do the job that's now being handled by the TD-9 INTERNATIONAL DROTT *Skid-Shovel.*

"There's been no drop in production but we're saving 20 gallons of fuel daily in addition to the reduced equipment cost. The Skid-Shovel's a lot more versatile, too, handling many jobs the crawler-dozer was unable to touch."

Chances are you may be wasting power and equipment on your materials handling jobs—if you're not powering them with INTERNATIONAL DROTT Skid-Shovels. Best way to find out is to call your INTERNATIONAL Industrial Power Distributor for a demonstration. You stand to gain plenty—in lower equipment costs, lower fuel bills, greater equipment versatility—so call him soon.

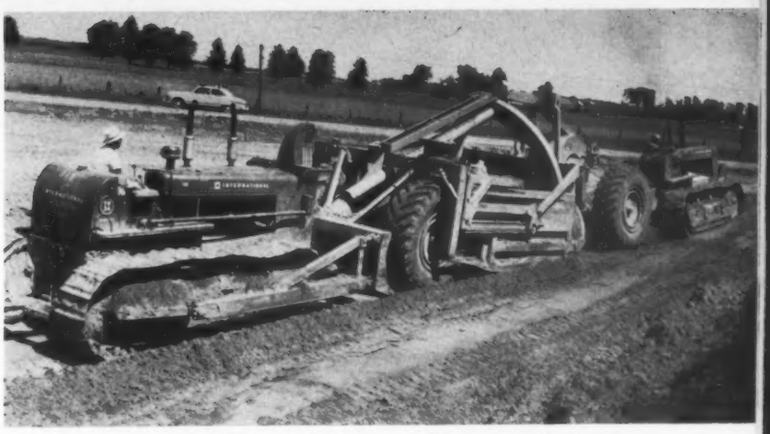
"SHE'S POWERFUL AND FAST," says operator Allen Alsgood. *"I have a clear view of the work at all times and the Skid-Shovel is a snap to operate,"* he adds.

INTERNATIONAL HARVESTER

INTERNATIONAL® DROTT

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS
DROTT MANUFACTURING CORP., MILWAUKEE 8, WISCONSIN

Contractor completes ten miles of grade, base, and surface despite wet season, heavy traffic



In a borrow pit alongside the right-of-way, a pair of International TD-24 tractors help a LeTourneau W scraper pick up a 20-yard load of sand. The push tractor is equipped with a Bucyrus-Erie dozer.
CE Staff Photo

Some cuts were so wet that the equipment quickly bogged down. These areas were drained as much as possible, allowed to dry out, and reworked until they set up. Last season's frequent rains made this a long-drawn-out process at times.

Fills were built up to within one foot of the bottom of the paving slab, and cuts were undercut to the same grade. A 5-inch course of pit-run sand and gravel was then spread over the subgrade to form a subbase. Some of the 80,000 cubic yards of subbase material was secured from borrow pits adjacent to the right-of-way and hauled and spread by scrapers. The remainder of this sand and gravel, secured from pits, was hauled an average of 3 miles to the roadway. Material in the pits was loaded into a fleet of hired trucks by the D7 with end loader. As the sand was dumped on the subgrade, it was dozed into uniform layers and carefully compacted by two Bros 13-wheel Wobble Wheel rollers pulled by Caterpillar D7 and D8 tractors.

Gravel Base

Two courses of gravel base material were placed over the subbase and thoroughly watered and compacted. The furnishing and placing of the 165,000 cubic yards of base material was sublet to Koepke Sand & Gravel Co., Inc. Appleton, Wis. This firm also supplied concrete aggregates for the paving. The first base course was a 4-inch layer of crushed gravel graded from 1½ inches down. The second was a 3-inch course of material graded from ¾ inch down.

While the grading and base work was progressing, Griffith set up a batch plant and started preparations for paving. Cement was delivered to the plant in truck-trailers from Green Bay and Manitowoc, Wis., and stored and handled by a Butler plant containing three 1,000-barrel silos. Batches were weighed out and deliv-

(Concluded on next page)

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Further information or descriptive literature can be secured from any advertisers in this issue of CONTRACTORS AND ENGINEERS. Just write name of manufacturer and product of interest to you on the extra line provided on the post card facing page 18, fill in your own name and industry connection, mail to us and we'll do the rest.

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With Fuller Model 10-A-1120 Transmissions in fleet of 23 Autocars, Allegheny Construction Equipment Company is getting more work time, less downtime through the right gear ratios to meet load and grade, with shorter, easier shifts that help provide faster work cycles.

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And that's why with over 110 Fuller models to select from—both semi-automatic and full-manual control—*you'll find a transmission designed to do your job . . . better . . . at less cost.*

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FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

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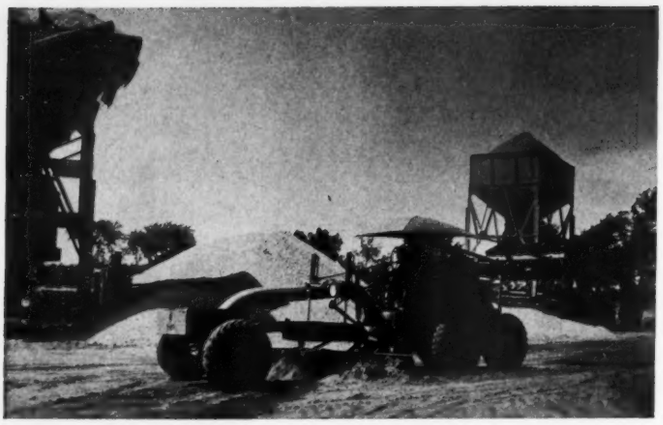

Maintaining the yard and haul road, and small loading assignments are handled by this Allis-Chalmers D motor grader with Tractomotive Tractoloader. The Butler bins of the batching plant are in the background.

C&E Staff Photo

(Continued from preceding page)

ered to trucks by a double weigh batcher under one of the silos.

Two sizes of coarse aggregate were handled from a Butler two-compartment bin, and sand was batched from another Butler bin. The Manitowoc 2000B crane, using an Owen 1½-yard clamshell bucket, charged the aggregate bins from stockpiles. Aggregates were delivered by truck by the supplier. Each batch truck carried two 37.4-cubic-foot batches to the paver.

A Lakewood subgrader and an Allis-Chalmers Model D motor grader prepared the grade ahead of the paver. A Cleveland Trailplaner made the final adjustment just behind the Koehring 34-E Twinbatch paver. Two Jaeger finishing machines and a Koehring longitudinal float finished the concrete, and a Flex-Plane jointing machine inserted the center joint cutter. A Flex-Plane sprayer applied membrane curing compound to the finished surface. Transverse joints were sawed later by a Clipper concrete saw.

Break Up Old Pavement

When the pavement was completed, a 10-foot shoulder and the complete ditch section were finished on the west side—the side farthest from the old road. A 5-foot temporary shoulder was built on the east side so that the roadway could be used safely by traffic. The old road was then closed and traffic routed onto the new pavement.

Using a Koehring 304 truck crane with a 5,200-pound breaker ball, Griffith then broke up 10 miles of the old concrete slab. The D7 with front-end loader and a TD-18 with Drott Skid-Loader loaded the broken concrete into trucks. These hauled the material to areas where it could be incorporated into fills. Some of the grading equipment then came back and completed the shoulder and ditch section on the east side, eradicating all evidence of the old roadway. During the periods when equipment was working on the roadway being used by traffic, the contractor found that the flashing red lights of Neo-Flashers attached to warning barricades were very effective in warning drivers of particularly dangerous areas.

Personnel

Although most of the business is handled by his two sons, J. R. Griffith paid frequent visits to the job during the season. One of the sons, Richard, handled the grading and base work, and the other, Frank, supervised the concrete paving operations. Ray Berg was project engineer for the Wisconsin State Highway Commission. The project was supervised through the Green Bay district of the department, with L. W. Empey as district engineer. S. E. Hicks is engineer of construction supervision, and Emmons L. Roettiger is state highway engineer for the Wisconsin commission. THE END

Literature Describes Mobile Radio Equipment

■ Literature is available on the wide range of mobile radio equipment manufactured by Allen B. Du Mont Laboratories, Inc., 750 Bloomfield Ave., Clifton, N. J.

The communications equipment shown includes mobile transmitters and receivers, fixed station equipment, remote-control apparatus, and point-to-point relay control equipment. The concern also manufactures allied accessories for emergency services.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 695.

Galvanized Beth-Cu-Loy culverts simplify installation and maintenance

Because it is made of steel, a culvert of Beth-Cu-Loy galvanized sheets is strong, yet light enough to be handled easily and economically. Its flexibility makes grade maintenance and alignment relatively easy. Its long lengths reduce the number of field joints. And its copper content, plus generous prime zinc coating, provide rust-resisting qualities that assure long service life for the pipe.

Galvanized steel offers many other advantages for drainage installations. Culvert pipe made of galvanized steel will withstand impact and the actions of freezing and shifting soils. It needs no cradling in unstable soils, and does away with the root hazard. It conforms to the rigid standards of the American Association of Highway Officials' specifications.

Bethlehem does not fabricate culvert pipe, but manufactures Beth-Cu-Loy galvanized culvert stock for those who do fabricate it. For the names of fabricators in your area, just drop a line to the nearest Bethlehem office.

Culvert can be shop-made in long sections, reducing number of field connections. Simplicity of joints themselves is another economy feature.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

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Self-Propelled Model Of Backhoe Digger

■ A new self-propelled hoe-type digger has been announced by the Badger Machine Co., Winona, Minn. The Hopto Model 185 SPR is a standard Hopto digger mounted on a rubber-tire carrier.

The new machine can dig approximately 11 feet deep and is available with buckets from 8 to 36 inches in width. Swing of the unit is a full 180 degrees.

Hydraulic built-in outriggers operate individually to permit the operator to level the unit from the carrier seat. Power is provided by a Continental 226 water-cooled engine.

For further information write to the company, or use the Request Card at page 18. Circle No. 623.

All-Purpose Frame for Sectional Steel Scaffolds

■ A new all-purpose frame for use in erecting Trouble Saver sectional steel scaffolds has been announced by The Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City, N. Y.

The new design features of this frame are reported to make its use economical in masonry construction and repairs. With its built-in ladder, it is recommended as a rolling scaffold for interior and exterior maintenance.

Installing planking at any level within the frame provides a two-level scaffold. Side-wall brackets can be used to form a separate mason's platform.

Made in five heights of 3 feet to 6 feet 6 inches, the frame is 5 feet wide. It is available with or without the fast-acting SlideLoks for securing diagonal braces to studs.

For further information write to the company, or use the Request Card at page 18. Circle No. 733.

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CONCRETE CURING COMPOUNDS

NOW AVAILABLE IN SOUTHEAST

Write for complete information

HUNT PROCESS CORP., SOUTHERN
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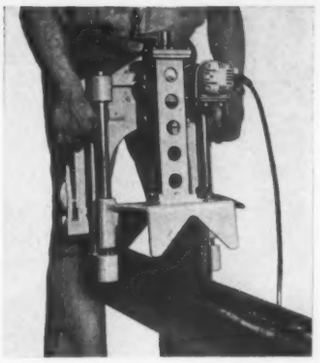
Equipped with special saddle base, the portable Wachs Guillotine saw cuts pipe at right angles making a square cut.



Specialized Saw Cuts Iron and Steel Pipe

■ The recently introduced Wachs Guillotine saw cuts 2 to 8-inch cast iron and steel pipe, as well as bar stock and beams. Attaching to the pipe by a chain pipe-vise clamp, the unit is ready to operate quickly. The saw has a cast-steel V saddle base to guide the cut at right angles to the pipes and to produce a square cut.

The manufacturer reports that the saw will cut 6-inch standard-wall steel pipe in four minutes. It cuts 6-inch standard-wall cast-iron pipe in about three minutes.

For further information write to E. H. Wachs Co., 1525 N. Dayton St., Chicago 22, Ill., or use the Request Card at page 18. Circle No. 618.

The Joy Mediumweight Wagon Drill is designed for a 4 in. drifter and a 9 ft. feed travel. Drills easily to 24 ft. or more.

INCREASED FOOTAGE
EASIER OPERATION
LONGER LIFE
from these 4 Joy
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...only JOY gives you ALL these Features...

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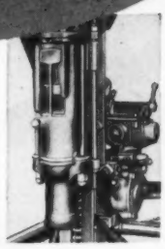

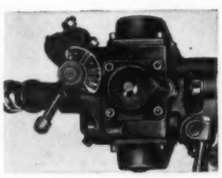

"DRILL AND BLOW"

HYDRAULIC LIFT

POSITIVE-LOCKING BRAKES

WAD C 5512

JOY-PIONEERED CADMIUM PLATED DRILL Only Joy Drills offer this silver-like protection (inside and out) that prevents rust, corrosion, and piston scoring—aids normal lubrication.

JOY-PIONEERED "DRILL & BLOW" FEATURE All Joy Wagon Drills blow dust and cuttings from the hole *while drilling*—no need to stop for blowing. Single drill-control lever for speed and convenience.

JOY-PIONEERED HYDRAULIC LIFT The drill, feed, and supporting arm are raised to drilling position in seconds. No laborious cranks or worm gears. Opening a valve lowers the frame quickly and smoothly.

JOY-PIONEERED WAGON BRAKES Only Joy Wagon Drills have positive-locking brakes which do away with chocks and rocks, reduce setup time.

For complete details on Joy Wagon Drills, write for Bulletins GG-2C and GG-2D, to ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

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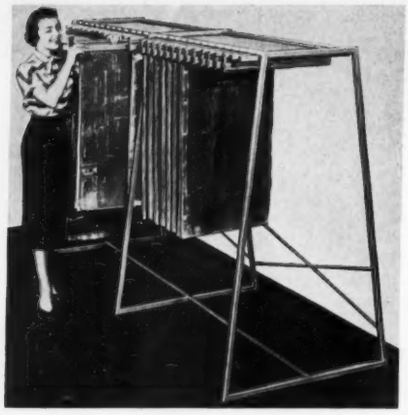


The Glider blueprint rack holds up to 1,500 prints with simple thumb-screw holders. New extension units double the rack's capacity.

New Blueprint Rack Simplifies Filing

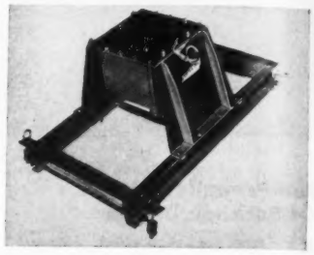
■ The recently introduced Glider rack that makes it easier to file and locate blueprints is now available with an extension that doubles its capacity. The extension, like the original rack, is equipped with 12 plan holders to hold as many as 1,500 individual prints. From 1 to 100 prints may be slipped into each holder and tightened into place by a simple thumb screw.

A single Glider rack stands 5 feet high, 4 feet wide, and is 3 feet deep. The new extension is the same size as the rack.

For further information write to Momar Industries, 4323 W. 32nd St., Chicago 23, Ill., or use the Request Card at page 18. Circle No. 603.

New Vibrating Screens

■ The new Series VS Syntron screens is compact, lightweight, and operates with dust-sealed electromagnetic vibrators. Screen-cloth tension is maintained by a fixed hook bar at the discharge end and an adjustable hook bar at the feed end. Welded steel channels form a rigid screen frame above which the vibrator is mounted. The vibrator's moving armature rod



The Syntron Co. has announced a new line of electromagnetically operated vibrating screens, the Series VS.

is attached directly to the screen cloth through transverse steel bars on both sides of the screen surface.

The new series of screens is available for cable suspension mounting or for floor mounting. The screen surface can be maintained at an adjustable angle of 33 to 40 degrees from horizontal.

The screens operate on 110, 220, or 440-volt, 50 or 60-cycle current. Single-deck single-vibrator models are available in the following sizes: 18×36, 24×48, 36×60, and 48×72 inches. Double-deck dual-vibrator models are made in 18×36, 24×48, and 36×60-inch sizes.

For further information write to the Syntron Co., 227 Lexington Ave., Homer City, Pa., or use the Request Card at page 18. Circle No. 655.

Laboratory Press Used For Cement-Crushing Tests

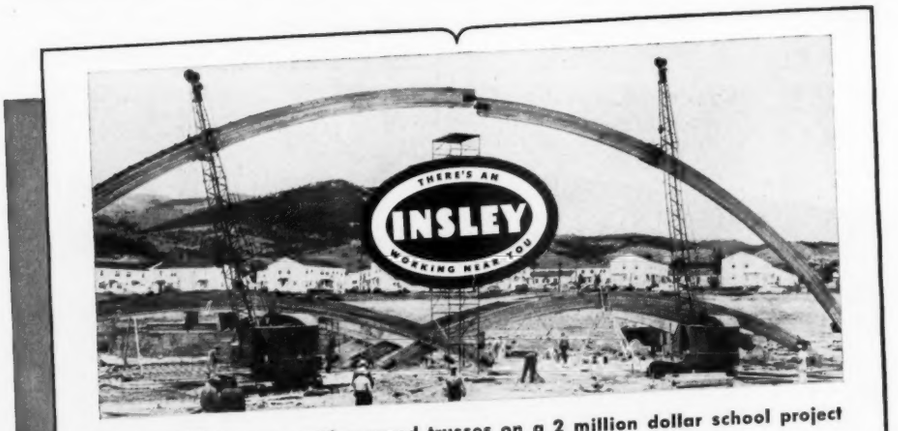
■ Literature on the Carver laboratory press illustrates its use in a wide variety of testing applications. For crushing and breaking tests, the press is furnished with swivel plates to provide for crushing tests of standard 2×2-inch cement cubes and 2×4-inch cylinders.

The gage has a working range of zero to 20,000 pounds and indicates directly the total force applied when the specimen breaks. Gages in several ranges are listed in the booklet.

To obtain Catalog L-5 write to Fred S. Carver, Inc., Box 329, Summit, N. J. or use the Request Card that is bound in at page 18. Circle No. 731.

Tishman Firm Moves To Larger Quarters

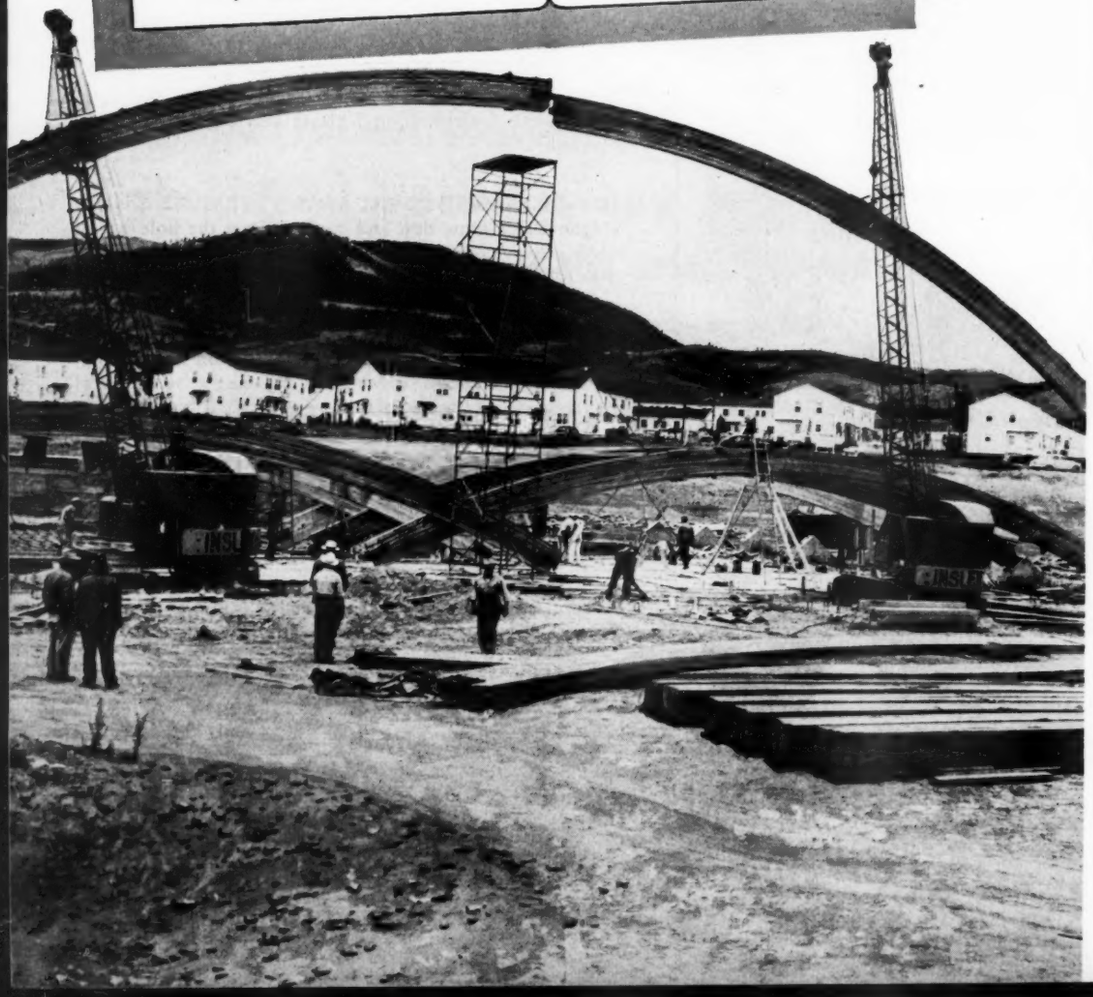
The Tishman Realty & Construction Co., Inc., New York, N. Y., has moved its executive offices to a new 22-story aluminum-faced air-conditioned building at 460 Park Avenue. The company had formerly been located at 445 Park Avenue, in the city's first post-war fully air-conditioned building, which had been constructed by the Tishman organization.



Two INSLEY cranes setting wood trusses on a 2 million dollar school project

The excellent boom control and overall operating characteristics of the Insley crane are necessary for smooth accurate placement of these wood trusses into locking position. Let your Insley distributor show you "an Insley at work."

The Insley Manufacturing Corporation of Indianapolis has been manufacturing construction equipment since 1907. The Insley Line includes excavators and cranes, 5 to 30 ton capacity—rubber or crawler mounted—gasoline, diesel or electric power. There's an Insley working near you.



New 195-Hp Motor Grader Offers Advances In Power, Transmission, and Blade Control

The new 195-hp Huber-Warco Model 5D-190 motor grader.

■ The first new piece of construction machinery to be announced by the recently-formed Huber-Warco Co. is a 195-hp motor grader designed to handle the heaviest grading jobs. Power for the Model 5D-190 grader is supplied by a General Motors 6-71 diesel engine through a torque converter and a full-power-shift transmission.

The power train eliminates the need for a clutch and reduces shock loading, thereby reducing maintenance requirements and extending the service life of the machine.

The tail shaft governor automatically adjusts the engine rpm to meet any load conditions at any ground speed set by the operator. Ground speed of the 5D-190 ranges from 0.85 to 20 mph. An Allison Torqmatic transmission permits power shifting while the grader is under full load. This is accomplished without any reduction of speed or loss of power.

The new Huber-Warco machine weighs approximately 32,000 pounds and uses 16.00 × 24 tires. This large tire size tends to maintain equal flotation all around the grader and also provides sufficient ground friction to resist the side thrust of the blade in operation.

An important operating feature built into the 5D-190 is convenient and fast blade positioning. Controlled entirely from the cab through hydraulic power, the blade can be shifted from 90 degrees on one side of the grader to 90 degrees on the other in less than a minute.

A high arched front axle gives a front-end clearance of 32 inches. This permits the grader to straddle higher windrows than most graders, and provides greater clearance for rough cuts. A 13-foot power-sliding moldboard is standard equipment.

Other features of the 5D-190 include: mechanical steering with hydraulic booster; single-member continuous box-frame design which resists stresses; and high blade clearance. A retractable scarifier permits 360-degree blade rotation without the need to remove scarifier teeth.

Huber-Warco Co. was formed recently through the consolidation of Huber Mfg. Co., Marion, Ohio, and W. A. Riddell Corp., Bucyrus, Ohio.

Among other products manufactured by the new company are: general purpose, finishing, and variable-weight 3-wheel rollers; variable-weight tandem rollers; general and heavy-duty motor graders; and a maintainer with 10 attachments, designed to handle a variety of maintenance jobs.

For further information write to Huber-Warco Co., 202 N. Greenwood St., Marion, Ohio, or use the Request Card that is bound in at page 18. Circle No. 659.

Link-Belt Promotions

Two new sales executives, C. M. Basile and Gordon W. Rowand, have been appointed by Link-Belt Speeder Corp., Chicago, Ill. Mr. Basile is vice president of manufacturing and sales, and Mr. Rowand is sales manager. Both will make their headquarters in Cedar Rapids, Iowa.

How Long Will a PAYLOADER® Last?

Model HM clocks over 18,000 hours

WALT KEELER, Pres.
Walt Keeler Company, Inc.

He says," . . . these machines have given us a more economical performance than the track-laying tractors, due to the abrasiveness of the sand and gravel they are subjected to. Furthermore, rubber-tired tractors are faster, which is also an asset to our operation."

WALT KEELER has used a fleet of tractor shovels for many years on his sand, gravel and ready-mix operations at Wichita, Kansas.

He bought his first "PAYLOADER" tractor shovel, a four-wheel-drive model, in 1949 and added two more later. Last December he traded in the oldest on a new one. This old 1949 unit had clocked over 18,000 hours of use — nearly twice what is considered normal for construction equipment — and was still in fair condition. Needless to say, Mr. Keeler is sold on "PAYLOADER" tractor shovels.

This factual report is not intended to create the impression that every "PAYLOADER" will give every owner 18,000 hours of satisfactory service. But it is an example of what proven "PAYLOADER" design, plus "PAYLOADER" Distributor service and intelligent preventive maintenance by the owner can accomplish.

THE FRANK G. HOUGH CO.
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Send catalog covering all seven "PAYLOADER" MODELS AND the many useful attachments for them.

Name .....

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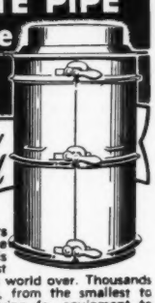
For the FINEST CONCRETE PIPE You Need the FINEST FORMS!

THE "Quinn" Standard



Backed by over 40 years of reliable service, the QUINN STANDARD is recognized as the finest concrete pipe form the world over. Thousands of pipe manufacturers, from the smallest to the largest, look to Quinn for equipment to produce the finest concrete pipe at the lowest possible costs.

• QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry process. Sizes for pipe from 10" to 120" and larger. Tongue and groove or bell end pipe in any length desired. WRITE TODAY for complete information and estimates.

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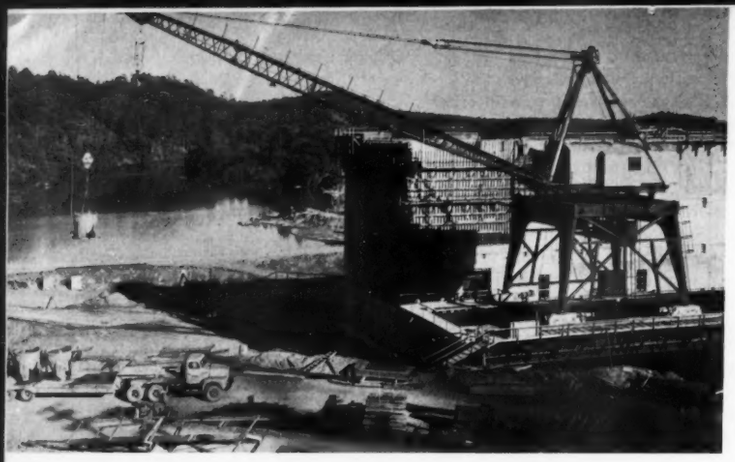
Quinn WIRE & IRON WORKS
BOONE, IOWA



Two 2-yard Blaw-Knox buckets are delivered to the Washington revolving crane by trailer. The crane, which could reach any part of the powerhouse area, handles an extra bucket which speeded concrete-placing operations.
C&E Staff Photos

Powerhouse construction completes Mt. Blakley Dam

The rolled earth-fill dam of the Blakley Mountain project now stands at its completed height of 230 feet above the river bed, Lake Ouachita is rising on the upstream side, and the completion of the powerhouse this summer will shortly permit the full operation of the multipurpose Arkansas dam.

The facility, costing an estimated $3 million, is located near the village of Mountain Pine, 13 miles northwest of Hot Springs, Ark. Destined to aid flood control in the lower Ouachita River valley and produce electric power with two 37,500-kw generators, the dam will stabilize the levels of Lake Hamilton and Lake Catherine, below, and create Lake Ouachita. This new lake will have a surface area of 40,100 acres at maximum power pool elevation and will extend back into the mountains for 25 miles.

The main dam, completed late in 1953, is about 1,200 feet long. Its base has approximately the same width. Side slopes are 3 to 1 on the upstream face and vary from 2½ to 1 to 3 to 1 on the downstream face. The downstream face is covered with 12 inches of dumped riprap, and the upper face has 24 inches of riprap from the top to 10 feet below minimum power pool. Altogether, 5,000,000 cubic yards of earth and rock fill from nearby borrow pits and quarries went into the structure.

Construction of the powerhouse—the final stage of the project—was started in 1953 by Al Johnson Construction Co., Minneapolis, Minn., under a $5,059,000 contract. The first problem for the contractor was to dewater and clean out a large hole which had been eroded in the rock at the tunnel outlet where no permanent stilling basin had been installed.

After an earth cofferdam had been built around the downstream sides of the powerhouse area, a 10-inch Layne vertical turbine pump was installed in the hole and, with the assistance of a number of portable pumps, the area was dewatered. The 10-inch turbine was kept in operation during the entire construction period to remove seepage and rainwater from the area.

Construction of a ramp leading into the hole permitted a Caterpillar D8 tractor with dozer to get to the bottom and start cleanup work. A Koehring 1005 crane with a Blaw-Knox heavy-duty 1½-yard clamshell bucket removed the loose material which included a number of large rocks. Backfill concrete was placed by the same crane, which used Blaw-Knox 2-yard bottom-dump buckets to handle the 10,000 cubic yards of backfill concrete. Part of this oper-

How a fast, compact TENNANT Sweeper...

City of Winston-Salem (N.C.) sweeps downtown walks with their Tennant "75" Sweeper.

sets a new standard in clean, LOW-COST sweeping

In busy downtown areas, where *clean* sweeping counts most, but is costly—a compact TENNANT Power Sweeper pays for itself fast. It not only *does the work of a crew of men;* it sets a new standard for clean work. You'll see the difference.

Sweeping easily around parked cars, its powerful brush-and-vacuum system rapidly cleans a 48" path. Picks up dust, dirt, paper, sand—the usual loose light litter found in gutters, on walks and in alleys. Does a remarkable job.

It's rugged . . . compact . . . easy to use; and superbly engineered for long, dependable service.

Write today for details.

SPECIAL FEATURES

- Sweeps 4 to 8 times faster than by hand.
- Sweeps EXTRA CLEAN; has vacuum dust control.
- Dumps load mechanically.
- Cleans 48" path; can sweep flush with walls, curbs.
- Reverses instantly.
- Steers easily in traffic; has 38" wheelbase.
- Can also be used in PARKING LOTS, RAMPS, GARAGES, etc.

G. H. TENNANT COMPANY
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TENNANT POWER SWEEPERS

SPECIALIZED MAINTENANCE EQUIPMENT

the SAFE WAY...

THE WRIGHT WAY TO SAW WOOD

SAFE-GUARDED BLADE

Land clearing? Precision cutting of dressed lumber? Sheathing cutoffs? Only the WRIGHT Gas Saw is designed to do every construction woodcutting job. New guarded reciprocating blade permits smooth cuts with hand saw accuracy and safety — as well as rugged service for felling, bucking, limbing and brush clearing.

SAFEST — Thousands in use and *not a single accident report received* — guarded blade — no revolving teeth — safe even when used overhead or in tight places.

HANDIEST — No special operator training required — cuts in all positions — weight only 25 pounds.

LOWEST MAINTENANCE COSTS—No chains—no gears—simple design means less parts than any chain saw—replacement blades less than $10.

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COMPANION TO THE WRIGHT AIR SAW

SEE YOUR DEALER FOR A FREE ON-THE-JOB DEMONSTRATION

Rush dealer's name and free details about the Wright Saw to:
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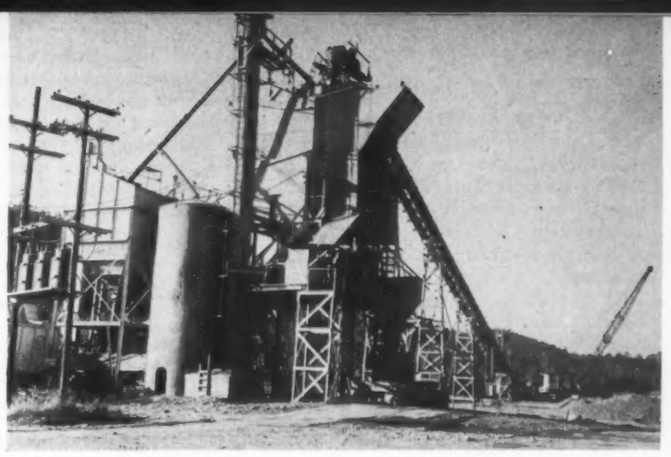
WRIGHT POWER SAW — Sheboygan, Wisconsin
A Division of Thomas Industries, Inc.



Concrete for the dam structures is batched in this Johnson plant, which has a Blaw-Knox square cement-storage tank and Barber-Greene and Pioneer conveyors.

Total of 54,000 yards of concrete goes into structure; system of delivering the concrete saves placement time

by RALPH MONSON
field editor

ation required the big 100-foot boom of the Koehring to reach out as far as 95 feet with the concrete buckets. Daily pours of up to 450 cubic yards were made.

To seal off seepage through the laminated shale rock structure, a grout curtain was pumped into the rock around the powerhouse foundation. Grout holes from 20 to 60 feet deep were spaced at intervals of 2½, 5, and 10 feet by the stage grouting method. The 10,000 linear feet of grout holes absorbed nearly 30,000 sacks of cement. This portion of the work was sublet to Jones Core Drilling Co., Inc., Dallas, Texas, which used gasoline-powered rotary drills, and air-powered grout mixer, agitator, and pumps.

In the area between the powerhouse and the surge tank, a 42-ton Washington revolving gantry crane operated on enough track to enable it to reach the entire powerhouse area. This crane handled most of the heavy lifting required to install powerhouse equipment and place the concrete. After turbine foundations had been placed, the contractor began constructing the walls of the generator and erection bays while the turbine was being erected. Though this procedure necessitated some extra forming, it shortened the over-

(Continued on next page)

investments in HIGHER Production

MIXERMOBILE

Scoopmobile FRONT END LOADERS

3-Wheel Maneuverability
Above: Model H with hydraulic lift.
Below: Model C with cable lift.

Illustrated above, 1 cu. yd. Model LD-5—4-wheel planetary drive—4-wheel power steering—Pow-R-Flex twist-turn workability—114 h.p.—8 equal speeds forward and reverse. Also available, other 4-wheel drive models in a wide range of work capacities and a complete line of 3-wheel models. Write for literature.

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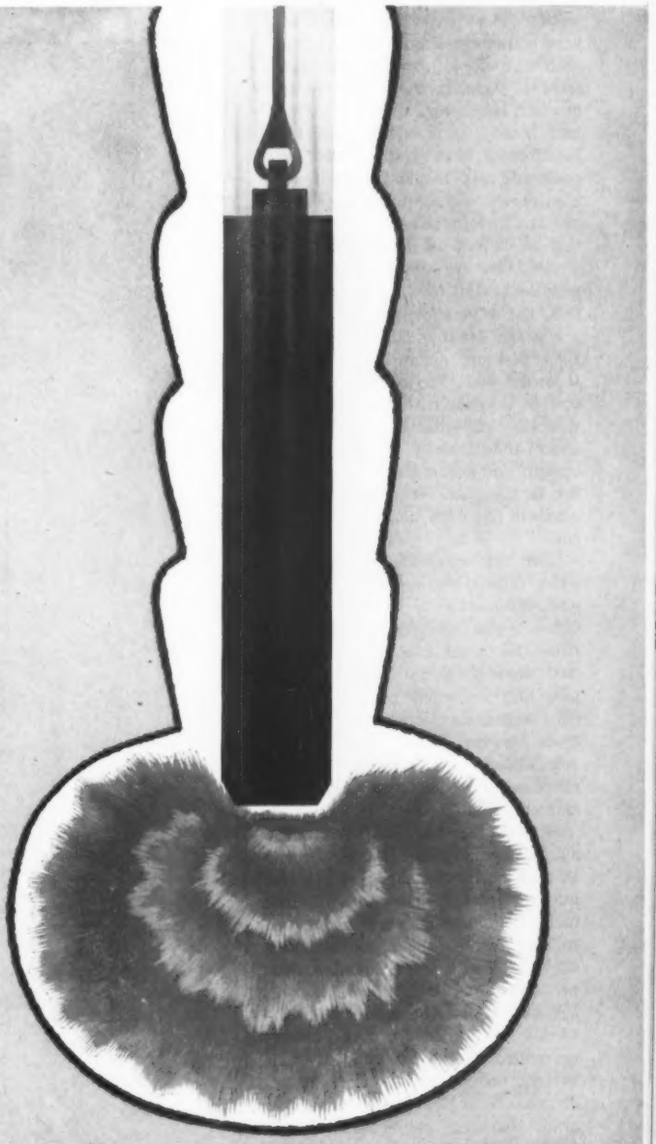

NOT formed by mere 15,000 foot pound blows of indirect energy
BUT forged by **150,000** foot pound blows of direct impact!

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(Continued from preceding page)

all construction period.

Placing Concrete

Form panels, prefabricated in a form yard and loaded on flat-bed trucks by an American truck crane, were set in place by either the Washington revolving crane or the Koehring 1005. At the form yard, lumber was precut by two De Walt power saws. For other operations a Crescent band saw, Crescent planer, and an ample number of SkilSaws, electric drills, and other units were available. In a special shop, where one man was kept busy sharpening saws, a Foley sharpener was used on band saws.

Most forms were constructed of 2-inch tongue-and-groove lumber backed with 3×6 studs and double 3×6 wales. Superior coil ties held the sections together. Where smooth finishes were required, forms were lined with Masonite or plywood. High walls, such as those of the generator and erection bays, were normally formed and poured in about 10-foot lifts. Reinforcing bars, prefabricated into cages and mats in a special yard, were transported and set in the same manner as the form panels.

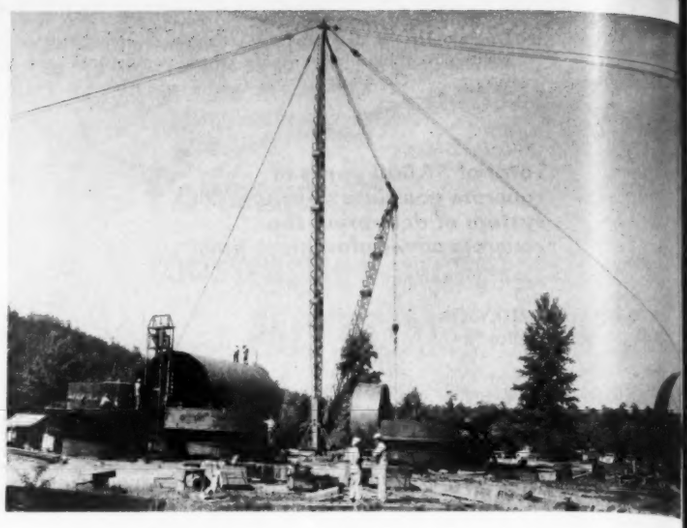
L. A. Tvedt of Memphis, Tenn., which built the intake structures as a subcontractor for Grones, Lundin & Cox, Inc. Minneapolis, Minn., set up a concrete plant on the bank of the river a short distance downstream from the dam. The powerhouse contractor purchased this plant, moved it to the rail siding about a half mile away and—instead of hauling the cement and aggregates from the siding to the plant—hauled the mixed concrete from the plant to the project.

With the exception of the Blaw-Knox cement-storage bin, the setup was essentially a Johnson plant. Cement was received in bulk cars from the Ideal Cement Co., Okay, Ark., unloaded in an undertrack hopper, and conveyed to the storage silos. Aggregates were received by rail from Malvern Gravel Co., Malvern, Ark., and unloaded by a 605 Koehring crane using a 2-yard Pettibone Mulliken clamshell bucket.

Between the railroad track and the aggregate stockpiles, a Barber-Greene 18-inch horizontal conveyor 160 feet long carried aggregates to a 150-foot inclined Pioneer conveyor which ran to the bins. As the crane bucketed aggregates to a track-mounted hopper straddling the horizontal belt, the hopper fed the aggregates uniformly to the conveyor. An air-tugger pulled the hopper along the rails to pick up the various sizes of aggregate. With this arrangement, the crane handled aggregates directly from cars to hopper, from stockpiles to hopper, or from cars to stockpiles—all from the same setting.

In the plant, the materials were weigh-batched to a 2-yard T. L. Smith tilting mixer which discharged into a hopper. Two truck-trailers hauled the mix to the job in four 2-yard Blaw-Knox concrete buckets. Each truck carried two full buckets per trip and returned with two empties. A fifth bucket was used to speed the operation. As a truck arrived at the point of placement, it picked up the extra empty bucket and had to wait only for one bucket to be emptied and returned to the trailer. The truck was on its way back to the plant as the second bucket of concrete delivered was being placed. Buckets were picked off the trucks and swung to the pour by the Washington revolving crane or the Koehring 1005. One of the hauling rigs consisted of an International R-210 truck pulling a La Crosse low-bed trailer.

Erection and stripping of forms and other related work was carried on during the regular day shift. Concrete was placed by a special night



An American guy derrick handles sections of 24-foot-diameter steel conduit in the fabrication yard. Here, a half mile from the powerhouse, the heavy sheets are assembled and braced before delivery to the site.

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New **262-HP Diesel Engine for more speed, more power**

Faster, **Easier Loading and Ejection**

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Easier **Operation, Greater Operator Comfort**

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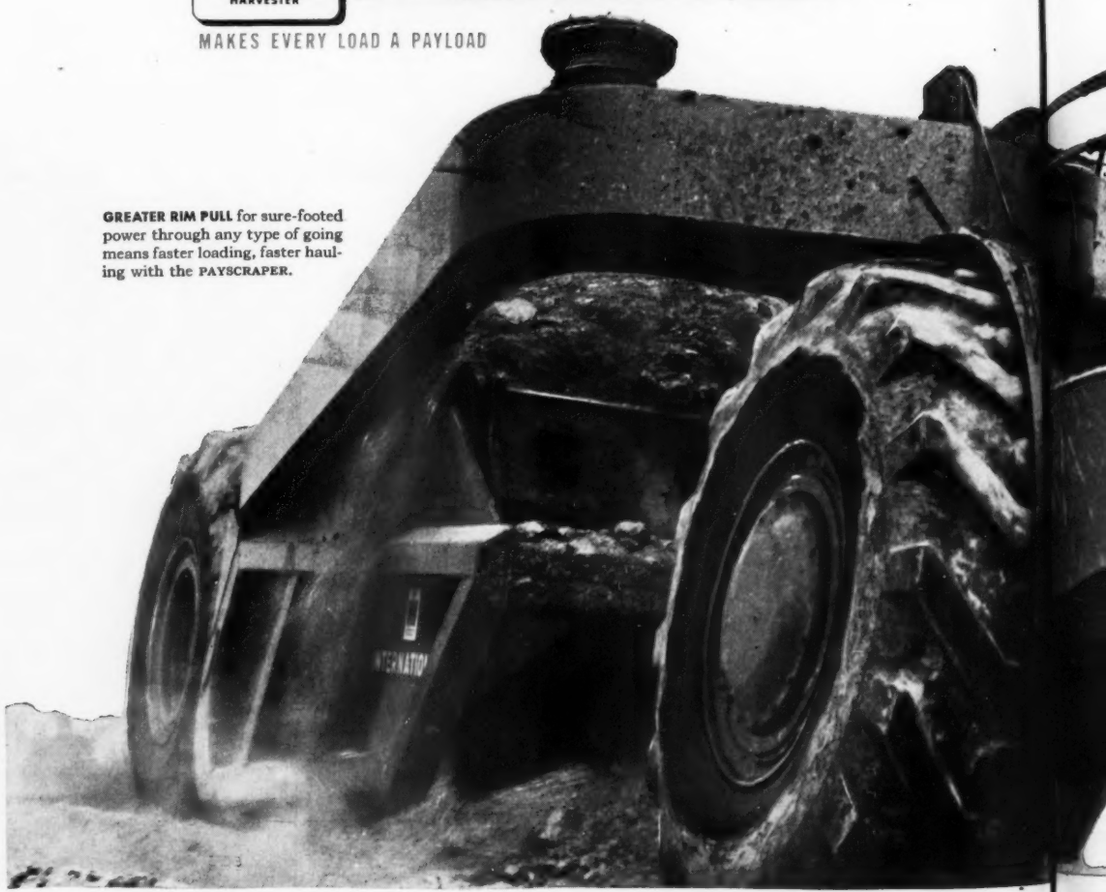
INTERNATIONAL® INDUSTRIAL POWER

MAKES EVERY LOAD A PAYLOAD



GREATER RIM PULL for sure-footed power through any type of going means faster loading, faster hauling with the PAYSCRAPER.

crew which started at 5:00 p.m. Concrete was placed with the aid of Chicago Pneumatic air-powered vibrators. Air for this and other operations was supplied by two 445-cfm electric-powered Gardner-Denver compressors and a 315-cfm diesel-powered Gardner-Denver compressor. Concrete was given a water cure by perforated hose and garden-type sprinklers.

Concrete mixes contained from 3½ to 6 sacks of cement per cubic yard, depending on the type of section being placed and the size of the coarse aggregate. For mass concrete, the maximum coarse aggregate size was 3 inches. For thin walls, aggregate was as small as 3/4-inch maximum. Darex was added to all concrete to obtain 4 to 4½ per cent entrained air. Under the powerhouse contract a total of 54,000 cubic yards of concrete was placed, together with 1,850,000 pounds of reinforcing steel.

Penstock and Surge Tank

Under a subcontract, Chicago Bridge & Iron Works, Houston, Texas, installed the 24-foot steel penstock in the power tunnel and erected the big surge tank. Steel sheets for the penstock were formed in Birmingham, Ala., and trucked to a fabrication yard about a half mile from the powerhouse. Three sheets, which made up one 10-foot ring of the conduit, were assembled into a ring in the yard, tacked together, and braced internally. Four such rings were then set in a jig, end to end, and the longitudinal seams were welded by an automatic welding machine with current supplied by a battery of General Electric welding generators.

The rings were then separated and loaded onto trucks to be transported to the tunnel outlet. The sections of conduit and other heavy pieces were handled at the fabrication yard by an American guy derrick with a capacity of 25 tons at 68 feet. At the tunnel outlet alongside the power plant, the rings were lowered into the tunnel by the Koehring 1005. Inside the tunnel, four of the 10-foot rings were assembled on a car running on rails in the tunnel invert. Here the sections were welded together inside and out by Unionmelt welds. These welds were applied by automatic machines at the rate of 9½ inches per minute as the conduit was rotated. Then the car carrying the 40-foot section was rolled into the tunnel, and the section was set on its bearings and joined to the previous section by hand welding.

The exterior of the conduit was carefully sandblasted and given a wash coat and a double coat of vinyl-type red lead in the fabricating yard. After being assembled, the penstock was given one additional double coat of red lead, and two double coats of vinyl-type aluminum paint. The interior was sandbagged after assembly and given a prime coat and a coat of hot-applied coal-tar enamel.

The steel surge tank is 55 feet in diameter and 149 feet high, rising above the height of the dam. It rests on a concrete tower 54 feet high, and is connected to the penstock by an 18-foot riser pipe in the center of the tower. Sheets for the tower were delivered to the site by trucks and hoisted into place by a guyless derrick inside the tank. This derrick actually had short guys confined to the inside of the tank. The mast consisted of a steel-pipe column 4 feet in diameter and with ⅜-inch walls. It rose 170 feet from the tank floor and carried a 65-foot boom. A two-drum Clyde hoist powered the derrick. More than 4,000,000 pounds of steel went into both penstock and surge tank.

Excavation and Backfill

The powerhouse contract called for 43,000 cubic yards of excavation. However, there were about 55,000, cubic yards of compacted backfill to place around the completed structure. Material was loaded in a nearby borrow pit by a 3/4-yard P&H dragline and hauled to the job in Chevrolet 2-ton dump trucks. A Caterpillar D6 with dozer and an International TD-9 with Hough front-end loader spread the material on the fill and placed it around the

An International tractor with sideboom loads steel rails on a truck trailer in the conduit-fabrication area. Altogether, 4 million pounds of steel are required for the penstock and surge tank.

"75" Payscraper

For the biggest of the big jobs, where outstanding performance is the key to profit, here's the rig:

The new INTERNATIONAL Model 75 PAYSCRAPER.

With that 262-horsepower diesel engine up ahead, you get plenty of power to pull out of the cut with an 18-cubic-yard heaped load. Up hills or highballing along haul roads at more than 24 miles per hour, the PAYSCRAPER has the power to deliver more production per day.

To see this great machine in action on your job, call your INTERNATIONAL Industrial Power Distributor today. See for yourself what this great new machine can do for you.

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

building. Close to the building, Barco tampers and Chicago Pnuematic air-powered tampers compacted the fill.

Embankment Overtopped

One of the most unusual features of the dam was the construction of a temporary spillway in the first stage embankment to permit overtopping by high water during the wet season following the start of the project. The dam could not be raised high enough in one season to retain the flood waters, and it was not economically feasible to construct the diversion tunnels large enough to carry the maximum expected flows. For this reason, a portion of the embankment was shaped into a trapezoidal weir, and the top and downstream face were riprapped and grouted to protect them from scour. At extreme high water that season, water flowed over the embankment with both diversion tunnels carrying full capacity.

Construction of the permanent emergency spillway in 1948 was the first step in the project. This uncontrolled spillway, located in a saddle about 1½ miles upstream from the dam, consists of a cut 200 feet wide down to rock. A 50-foot section of the bottom and side slopes is paved with concrete. Water overflowing here follows a creek channel and rejoins the river below the dam.

Diversion tunnels, completed in 1950, diverted the river during construction of the dam. Now they have been converted to serve as flood control and power tunnels. The concrete-lined flood-control tunnel is 19 feet in diameter and will be used to regulate the discharge of flood waters stored above maximum power pool. The 30-foot-diameter concrete-lined power tunnel was used for diversion purposes and later lined with a 24-foot steel penstock to deliver water to the power plant. For diversion purposes, the tunnels were connected to a diversion inlet which had portals about 15 feet above stream bed. When the dam had been raised sufficiently, the diversion inlets were closed and that portion of the tunnels plugged with concrete. The flood control and power tunnels were then connected to the permanent inlet structure which has ports 80 feet above the diversion inlets.

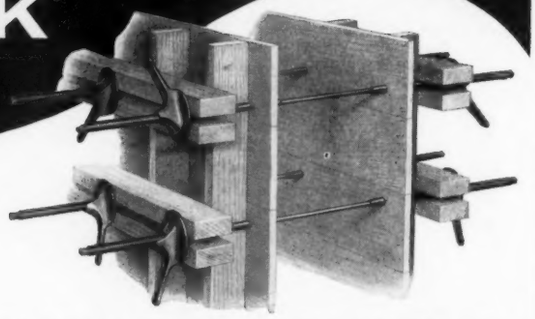
Personnel

Michael P. Grippo supervised construction for Al Johnson Construction Co. He was assisted by Oscar Englund, engineer. Ramon Sanchez was superintendent for Chicago Bridge & Iron Works. The tunnels were constructed by the SBHU companies, which consisted of the United Pipe Corp.; Charles L. Harney; Stolte, Inc; and Ralph A. Bell. The dam and intake structure were constructed by Groves, Lundin & Cox, Inc. Planning and supervision of construction is being handled by the Vicksburg District of the U. S. Army Corps of Engineers. For the corps, J. R. Stephens is resident engineer and A. Hedegaard, assistant resident engineer. Col. T. B. Simpson is district engineer for the corps. THE END

Prefabricated form panels for the 54-foot-high concrete base of the steel surge tank are set in place by a Koehring 1005 crane. The tank itself, 149 feet in height, towers over the top of the 230-foot-high earth-fill dam

When job conditions call for this type of Heavy-Duty Tie . . .

use SUPERIOR TILT LOCK CLAMPS

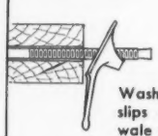


with SPECIAL Safety-Type Handle and Nut Washers

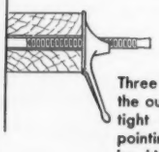
HANDLE WASHER

NUT WASHER

The malleable Handle Washer combines handle, washer and wrench—Designed for absolute safety; cannot fall off threads when load drops off or when handle is hit accidentally. The cast iron Nut Washer has all the features of Handle Washer except the open slot for use as wrench.



Washer, in tilted position quickly slips over stud rod threads to wale and is seated.



Three full turns on the threads of the outside rod bring it flush and tight against the wale. When pointing upward, the handle may be hit accidentally or pressure released during pouring. This may cause the handle to turn 180°, but the safety feature of 3 complete turns makes it impossible for the clamp to fall off the thread.

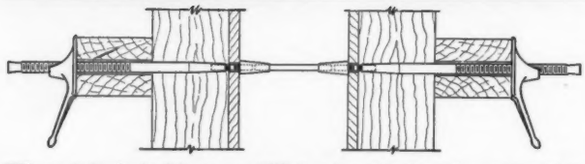
The "safety in use" of Superior's Handle and Nut Washers for Tilt Lock Clamps is shown at the left. The Tilt Lock Outside (Stud) Rods have outstanding features, too. The Outside Rod has ⅞" threads, five to the inch, rolled on a ¾" high carbon rod. This compares with the ¾" thread cut on a ¾" rod usually supplied. Cold rolled threads are tougher, and therefore more resistant to damage, and their contour greatly reduces the clogging of concrete and facilitates cleaning.

The Tilt Lock Outside Rod has a heavy cold forged rectangular end section that is ¾" wide and ½" thick, to which the Handle Washer is applied as a removal wrench. This forged section is practically indestructible, never becomes rounded after numerable reuses as does a milled end. Therefore, it is never necessary to use a Stillson.

Superior Tilt Lock Clamps are supplied with Outside Rods 16" long and 20" long, for both ⅜" and ½" inside tie rods. Extensions are available where field conditions require Outside Rods longer than 20".

Superior supplies high tensile inside rods with rolled threads. Form layouts and estimates are prepared from plans without charge or obligation.

with Cone Nuts for Spreader Action



Where it is desirable to use Tilt Locks with Superior Cone Nuts for spreader action or other reasons, Tilt Lock Rods are adapted for use with Cone Nuts as illustrated above.

Tilt Lock Clamp Assemblies may be rented with a ninety day option to purchase.

SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

New York Office
1775 Broadway, New York 19, N. Y.

Pacific Coast Plant
2100 Williams St., San Leandro, Calif.

Single-Groove Belt Drive Handles Wide Power Range

■ A new single-groove adjustable-speed drive available in Q, R, and W belt sections is announced by The American Pulley Co., 4200 Wissahickon Ave., Philadelphia 29, Pa. Recent improvements have increased capacities which this type of drive can handle, so that it will safely transmit up to a maximum of 30 hp.

The drive permits a speed variation of as much as 100 per cent at horsepower capacities comparable to former drives having two or three belts, according to the manufacturer. This type of drive offers a considerable saving of space as compared with multi-V-belt adjustable-speed drives.

For further information write to the company, or use the Request Card at page 18. Circle No. 634.

Color System Identifies Concrete Cutting Blades

■ Diamond blades for concrete and masonry-cutting saws are illustrated in literature from Robert G. Evans Co., 7204 Wyandotte, Kansas City, Mo. The Target diamond blades shown are marketed under a color identification system that makes it easier to choose the correct blade for any given purpose.

Tables in the folder explain this system and list the various types of blades available. Supplementing this is a section on how to select and use Target blades.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 718.

Small Asphalt Plant Has Increased Capacity

■ Equipped with a larger oil burner on the aggregate dryer and an improved dryer drum, the small Model L-8 asphalt plant made by the White Mfg. Co., Elkhart, Ind., now offers increased capacity. Production has been raised from 8 to 10 tons per hour to 10 to 15 tons per hour.

The manufacturer emphasizes that the 10-ton-per-hour rating is based on hot-mix of approximately 300 degrees discharge temperature. At lower temperatures, the L-8 has a capacity up to 15 tons per hour. The batch discharge from the pug mixer has been raised to an average of 850 pounds.

Among other improvements is a reciprocating-plate feeder, with a divided hopper and two separate discharge gates, that feeds sand and gravel in any desired proportion. This mechanical feeder is chain-driven from the aggregate loading elevator. It has a 2-cubic-yard hopper, and can easily be built up to hold more.

An important feature of the L-8 asphalt plant is one-man operation. Air-operated controls supplied with air from a built-in compressor permit quick handling of aggregate and final mix. Two clutch levers are now installed beside the operator's position, one for the feeder and elevator and one to control the pug mixer.

Three choices of power units are offered: a 50-hp gasoline engine, a diesel engine, or a 30-hp electric motor.

The L-8 asphalt plant is self-contained on a single rigid structural-steel frame and includes aggregate dryer with volumetric measuring equipment, batch-type pug mixer with built-in bitumen trough, and an asphalt-heating kettle.

For further information write to the company, or use the Request Card at page 18. Circle No. 699.

Small Compressor Attaches To Tractor Power Takeoff

■ A novel portable air compressor that quickly attaches to the rear power takeoff of all makes of tractors provides a convenient compressed-air supply on the job. The compressor has a capacity of 2 cfm at 400 rpm with pressures up to 120 psi, and will handle jobs such as power-greasing and spraying or pumping liquids.

Known as the Worthington-Mobilco air compressor, the new unit can also be converted quickly into a pump with the aid of a kit available for the purpose.

For further information write to the Worthington Mower Co., Stroudsburg, Pa., or use the Request Card at page 18. Circle No. 604.

Data on Rubber Hose

■ Four new catalogs covering its line of welding, steam, air, and petroleum hose are announced by Boston Woven Hose & Rubber Co., P. O. Box 1071, Boston 3, Mass. The catalogs treat recommended uses, construction, and specifications. Data included covers size, weight, and recommended working pressures.

Cutaway illustrations show the construction of each type of hose.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 630.

◀ The Model L-8 asphalt plant, built by the White Mfg. Co.

Bulletin Describes Line Of Centrifugal Pumps

■ Literature is available on C. H. & E. self-priming centrifugal pumps rated at 10,000 to 40,000 ghp.

The literature describes wheel-mounted pumps with 2 and 3-inch suction and discharge openings, and powered by single-cylinder air-cooled engines. It also shows two 4-inch pumps that are close-coupled to the engine. The impellers on these units run on roller-bearings and have a large clearance between blades to enable them to handle a good percentage of solids. Power units are 4-cylinder 20-hp air-cooled engines.

To obtain this literature write to C. H. & E. Mfg. Co., 3849 N. Palmer St., Milwaukee 12, Wis., or use the Request Card that is bound in at page 18. Circle No. 720.

Bucks logs right on the ground. Fast. Quick. Clean. Jaw-grip spike bites into dirt . . . keeps chain up out of dirt. Spike takes thrust of chain . . . prevents logs from rolling or spinning away.

Plunge-bucking speeds clearing operations. Gets into all kinds of hard-to-reach places. Enables operator to work quickly, but safely, in close quarters and on steep slopes.

NEW

CLEARING ATTACHMENT

FOR HOMELITE CHAIN SAWS

Here is a completely new Homelite development that makes a Homelite One Man Chain Saw an even greater time-and-money-saver. Converts the Model 17 Chain Saw into an *all-purpose clearing tool* . . . quickly, easily.

With this highly maneuverable new attachment . . . driven by the 3.5 h.p. engine of the 22 pound Homelite Model 17 . . . one man can do the work of a whole gang of men using saws and axes. He can fell, buck, and limb all small trees and saplings without bending, stooping or chain binding.

On demonstration after demonstration, men who have used this clearing tool agree that here is positively the best thing yet.

Write for a free demonstration.

Manufacturers of Homelite Carryable Pumps • Generators Blowers • Chain Saws

PERFORMANCE · DEPENDABILITY · SERVICE

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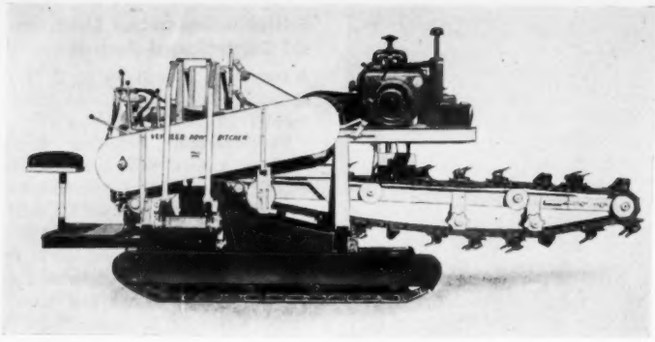
Canadian Distributors: Terry Machinery Co., Ltd., Toronto, Montreal, Vancouver, Ottawa.



The Pow-R-Ditcher Model 524T digs a trench up to 24 inches wide and 6 feet deep.

Two New Models Added to Line of Ditchers

■ Two new Pow-R-Ditcher trenchers just introduced by the Vermeer Mfg. Co., Pella, Iowa, are the largest and the smallest units, respectively, in the line of self-propelled ditching machines made by this concern.

The Model 524T, now the biggest Pow-R-Ditcher, will dig 8, 10, 14, 18, and 24 inches wide and to 6 feet deep. The 5,400-pound machine is equipped with an International 5-speed truck transmission. The power unit supplied may be either a Wisconsin 25-hp air-cooled or a Continental water-cooled engine.

The smallest unit in the Pow-R-Ditcher line is now the new Model 4T. Weighing only 2,500 pounds, this small ditcher will dig 6 to 12 inches wide and 4 feet deep. The 4T features a two-way dirt conveyor and is powered by a Wisconsin 15 or 25-hp engine. The digging boom is raised and lowered hydraulically, and the entire ditcher can be transported in a pick-up truck.

For further information write to the company, or use the Request Card at page 18. Circle No. 639.

The Camera Lucikon projects either a flat drawing or a 3-dimensional object upon a working surface, reducing or enlarging the subject as much as 400 per cent.

Device Projects Drawings Or 3-Dimensional Objects And Makes Photocopies

■ A single instrument that will project the image of a blueprint or drawing on a screen for copying or correction and that can also be used to make offset negatives and photocopies of the original has been placed on the market. The Camera Lucikon will project in true color any opaque, transparent, or three-dimensional object that can be placed on the copyboard, enlarging or reducing it as much as 400 percent.

The copyboard that accommodates the drawing or object to be projected is 29×29 inches in size. Dimensions of the working-screen surface is 24×24 inches.

A feature of the Camera Lucikon is that it offers parallel adjustments on the lens and copyboard. Operation is controlled by two hand wheels, one for the copyboard and the other for the lens board. The Camera Lucikon may be operated in a normally lighted office when used for tracing or comparing purposes. A darkroom is necessary for photographic functions.

For further information write to M. P. Goodkin Co., 889 Broad St., Newark 2, N. J., or use the Request Card at page 18. Circle No. 728.

Universal Joints Designed For Use in Limited Space

■ Roller-bearing universal joints for heavy equipment are illustrated in a booklet from Mechanics Universal Joint Division, Borg-Warner, 2026 Harrison Ave., Rockford, Ill. The literature features Mechanics close-coupled-type universal joints especially designed for operation within cramped quarters and where shafts are out of alignment.

Such applications are found in twin-engine-powered tractors and in tractors and trucks with rear engines. It is emphasized that the joints fit into spaces that engineers formerly considered too short for universal joints.

The new catalog showing the complete line of Mechanics universal joints also contains handy joint-tracing kits.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 739.

Announcing
The New UNIT Model 510
Challenger

DESIGNED with a BACKGROUND of 3/8 YARD EXPERIENCE

Evidence of highest quality engineering and construction includes alloy steels and forgings • anti-friction bearings • modern transmission design with involute splines to add strength and reduce wear • straight-in-line engine mounting with torque converter • trunnion supported tapered drums to eliminate bending stress on drive shafts • easily accessible hydraulic clutches • minimum number of main machinery gears enclosed in one-piece cast gear case • force feed lubrication • self-aligning replaceable hook shoes distribute applied pressure over maximum area • interchangeability of parts simplifies maintenance, cuts costs. All these UNIT advantages mean more profitable operations for you.

Why it's BEST to INVEST in modern UNIT models

Because each feature has been proven to contribute substantially to the Life, Performance and Efficiency which have made present and previous UNIT products readily acceptable.

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Please send me your new Bulletin on the UNIT CHALLENGER Model 510.

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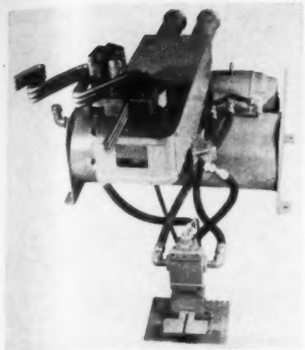

Designed for bending the web in steel joists, the new Wallace No. 35 hydraulic bender makes each successive bend without the need to turn the bar over.

New Open-Web Joist And Stirrups Bender

■ A hydraulic machine for bending the web in steel ceiling joists or the stirrups used for reinforcement in concrete columns has been announced by Wallace Supplies Mfg. Co., 1300-06 Diversey Parkway, Chicago 14, Illinois. Operated by two hydraulic foot valves, the Wallace No. 35 bender drives under full power both clockwise and counter clockwise.

Successive bends are made without reversing the bar. When one bend is completed, the bar is moved forward and lifted over the bending pins. It is then in position for the next bend in the opposite direction.

Capacity of the hydraulic machine is two 13/16-inch round bars or three 3/4-inch round bars. For changes in bar size or in radii on the same size bar it is usually necessary to have additional dies.

For further information write to the company, or use the Request Card at page 18. Circle No. 611.

Plastic Bonds Concrete To Other Hard Materials

■ A new plastic that is applied by brush to bond concrete to concrete or to iron, steel, brick, stone, or glass, has been announced by the Garland Co., Cleveland 5, Ohio. Inlaycrete bond does not require roughing of old surfaces with hammer or chisel. A surface coated with the plastic is ready for retopping in about 30 minutes.

The manufacturer recommends the plastic for laying new floor topping to old floor, patching holes in concrete, resurfacing worn steps or curbing, and for building restoration.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 632.

Mobile Power Unit Has Variety of Attachments

■ A booklet available on request shows a 5-hp power unit mounted in wheelbarrow fashion that operates a large variety of useful attachments.

Some of the attachments described include an air compressor for spraying, several types of mowers, a post-hole digger, a snowplow, a snow blower, and a power brush. Also available are a rotary tree saw, a hauling cart, and a small roller.

To obtain this literature write to Gravely Tractors, Inc., Dunbar, W. Va., or use the Request Card at page 18. Circle No. 704.

Portable Conveyor For Concrete-Placing

■ A conveyor that can be used to deliver concrete from a truck mixer to a placing point as high as three stories is made by Viking Mfg. Co., Manhattan, Kans. Powered by an electric motor or gasoline engine, the Viking conveyor will handle various slumps of concrete, elevating it up gradual or steep angles. The conveyor is rated by the manufacturer for capacities up to 30 yards per hour on continuous or intermittent pours.

A hydraulic hoist controls the raising and lowering of the conveyor. It is raised by a hand-pumping action and is lowered by releasing the hydraulic control valve.

The conveyor can also be used to hoist other materials such as blocks, sheets, and roofing.

The Viking conveyor delivers concrete to a third-floor level from a truck mixer at an angle of 51 degrees. The conveyor is reported to handle 20 to 25 cubic yards per hour of 3-inch-slump concrete.

For further information write to the company, or use the Request Card at page 18. Circle No. 690.

Sign up before it happens! Civil Defense needs you for wardens, police, and first aid.

Model C-250
25 H.P. Optional Self-Propelled.
A Clipper Model to fit Every Budget Priced from $395

NOW-SEE WHY
You Cut More Concrete with Clipper
"RAILS RIGHT THRU"
CONCRETE SAWS
--LOOK INSIDE
Behind Engine . . .
Under Frame . . .
for Famous . . .
CLIPPER QUALITY
plus 5 of the EXCLUSIVE FEATURES
THAT GIVE YOU LOWEST CUTTING COST PER FOOT!

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  Savings you never dreamed of—up to 80%! The original Reinforced Abrasive Blade that knifes through green concrete with aggregate of limestone, coral, or steel mill slag. "Try them on your next job."
- CLIPPER DIAMOND
  A Blade for any job—any aggregate—every saw! Choose your Clipper Diamond Blades from a wide variety of specifications to cut green or old concrete with outstanding speed and economy.

By the Makers of Clipper Masonry Saws

LOOK AT THESE 5 FEATURES
1. 4 Wheels with 3-Point No-Bind Blade Suspension
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3. Positive Screw Feed
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5. Dashboard Controls

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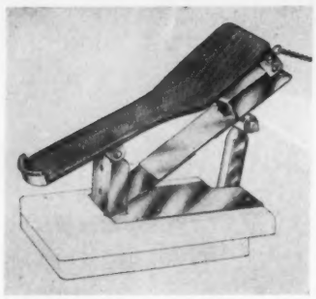


Keeping his foot on the Saf-O-Matic safety pedal, the driver of a vehicle can control both acceleration and braking with the single pedal.

Safety Pedal Combines Accelerator and Brake

■ A new automotive safety device that combines the accelerator and brake into one easily operated pedal has been announced by Schumer Enterprises, Inc., 32-57 Steinway St., Long Island City 3, N. Y. Installed in the position of the conventional accelerator, the Saf-O-Matic braking device makes it possible to stop moving vehicles as much as one second faster, according to tests reported by the manufacturer.

With the Saf-O-Matic pedal installed, the driver feeds gas to the carburetor by depressing the pedal with his right heel. To brake the vehicle, he depresses the same pedal with his right toe. Going from acceleration to braking with the single pedal permits an automobile traveling at 30 mph to reduce the distance required for stopping by about 15 feet, it is reported.

The Saf-O-Matic braking pedal can be adapted for use in trucks of any size.

For further information write to the company, or use the Request Card at page 18. Circle No. 750.

Centrifugal Pump Has Improved Mechanical Seal

■ A new two-inch self-priming centrifugal pump, the Flomax 8, has been announced by The Marine Products Co., 515 Lycaste, Detroit 14, Mich. Of cast-iron construction, this new unit weighs only 74 pounds and delivers 8,400 gallons per hour at 25 feet total head including a 10-foot suction lift. The Flomax 8 is powered by a four-cycle Briggs & Stratton engine with remote throttle control.

This model is one of a complete new series of engine-driven pumps featuring exceptionally hard greaseless mechanical seals, removable flanges, replaceable wear plates, and an open-adaptor construction. All models in this line are available in cast iron, bronze, and aluminum.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 705.

The Flomax 8 is the latest model in a new series of centrifugal pumps featuring very hard greaseless mechanical seals.

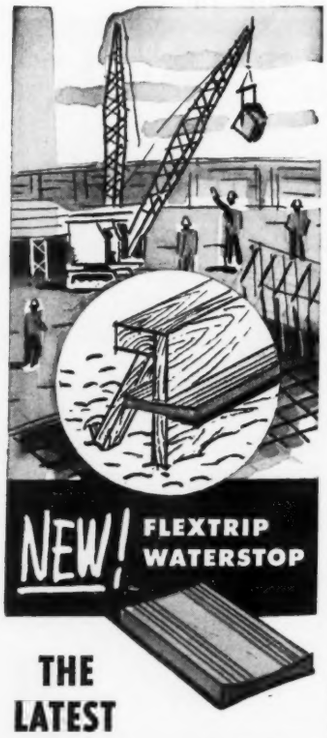
Sand-Blast Generators And Dust Collectors

■ The various types of sand-blast cleaning machines, dust filters, and welding-fume collectors made by Ruemelin Mfg. Co., 3860 N. Palmer St., Milwaukee 12, Wis., are illustrated in a new bulletin.

The blast generators shown are available in tank sizes ranging from ½ to 20 cubic feet in capacity. These machines are normally used with dry abrasive but can be converted to wet operation, if required. Rubber-tire models are particularly suitable for construction use.

The dust filters are built in capacities from 110 to 36,000 cubic feet and more. They are recommended for collecting dust such as that found in cement mills and mixing plants.

To obtain Bulletin 100-A write to the company, or use the Request Card that is bound in at page 18. Circle No. 719.



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VINYL PLASTIC WATERSTOP

for "wall-floor" and "between-pour" horizontal concrete construction joints

Water just can't get through joints protected by FLEXTRIP, the all-new, strip-type waterstop. Unique concave shape plus ribbed edges give FLEXTRIP a never ending grip in the concrete . . . is flexible enough to withstand extreme joint-separation (more than 3 inches) yet rigid enough to stand up to the battering effect of pouring concrete. Here's lasting joint-protection unmatched by any other waterstop. What's more, FLEXTRIP will never rust, rot, check or crack and is unaffected by acid, alkalies, petroleum products, chemicals or the most adverse atmospheric conditions . . . lasts as long as the concrete. Write for additional information on FLEXTRIP and other vinyl waterstops. Send coupon below.

Made by the makers of LABYRINTH WATERSTOPS . . . the standard waterseal on outstanding construction jobs everywhere — eliminates seepage problems . . . simplifies form work.

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9 South Clinton • Dept. 3, Chicago 6, Ill.

Without obligation, please send me information on your new FLEXTRIP and LABYRINTH WATERSTOPS.

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merton *Direct Line* overloader

Here's Proof! In actual loose material loading tests, the Merton Overloader accomplished 7 load-discharge cycles in 76 seconds . . . loaded 3.2 tons with a 1 yard bucket!

IT HANDLES ALL TYPES OF MATERIAL RAPIDLY AND EFFICIENTLY

Fordson Diesel powered — with variable height discharge of 6' 11" to 11' 2" — the Merton Overloader combines front end loader advantages with the speed of multi-bucket conveying. Provides full mobility and forward penetration, eliminates conventional manuevering requirements.

Loading cycles are speeded considerably, with substantial reductions in machine wear, maintenance, and operator fatigue.

Practical for all loading, the Overloader is particularly effective where space and movement are very restricted.

For complete information, ask your dealer or write direct.

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YOUR BEST TRUCK MIXER BUY

Puts Money In The Bank for Any Fleet Owner

3½ to 6 YARD CAPACITY

Again Improved for More Payload on the Road . . . More Concrete in the Forms

- EASIER, SIMPLER to handle on the road — on the job.
- THORO-MIX ACTION. Mixes, discharges all slumps.
- SIMPLEST DESIGN OF ALL. No maintenance or service problems.
- LIGHTER IN WEIGHT — yet more rugged! Outlasts them all.

CONSTRUCTION MACHINERY CO.
Waterloo, Iowa

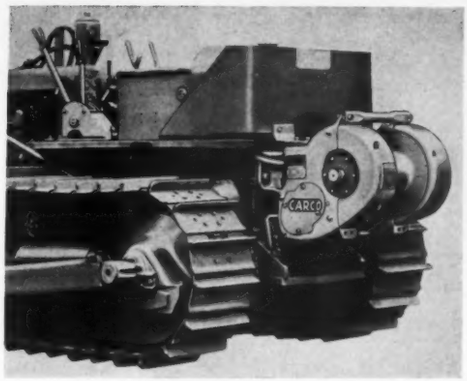
MC TRANSCRETE®

CONTRACTORS AND ENGINEERS

Tractor Winch Has Free-Spooling Feature

■ Production of a new model in the Series E Carco tractor winches has been announced by Pacific Car & Foundry Co., Renton, Wash. The most important feature of the Model E-24 winch is that the operator can control free-spooling from the ground using a control knob on the side of the winch. Acting as his own line handler, the operator pulls out the knob to disengage the cable drum and allow it to run free of gears.

A new semiautomatic braking system designed into the winch gives complete control of load at all times. The brake band overrides the drum, permitting the brake to be set as the load nears the tractor, just before the clutch is disengaged. As soon as the clutch is disengaged, the brake takes hold, eliminating the need for simultaneous operation of both clutch and brake by the driver. The new braking system is reported to give better distribution of braking effort.



A new free-spooling feature of the Model E-24 Carco tractor winch makes it possible for the operator to control free spooling from the ground while acting as his own winch-line handler.

The Carco E-24 winch is available with adaptions for installation on the Allis-Chalmers HD-5, International TD-9, and Oliver B tractors.

For further information write to the company, or use the Request Card at page 18. Circle No. 673.

Detailed Information On Portable Batch Plant

■ The Conveyco portable 5½-yard batch plant for truck-mix or dry-batch operation is described in considerable detail in a booklet from The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif. The plant is described as an easily portable unit designed for simple erection. The literature illustrates how the entire batch plant can be transported to the job site in four trailer loads.

Other Conveyco batch plants include portable and stationary plants with capacities ranging from 75 to 500 tons.

To obtain Catalog No. P4-80/125 write to the company, or use the Request Card at page 18. Circle No. 682.

New Physical Soil Tester Provides Greater Control

■ Control and accuracy in conducting consolidation tests on soil samples are features of the new Conbel physical soil-testing machine, according to the Tinius Olsen Testing Machine Co., 3046 Easton Road, Willow Grove, Pa. Designed by Karol and Warner, the Conbel can be used with any one of four standard consolidometers to give vital data for evaluating the amount and rate of settlement of soil under load.

The hydraulic loading system of the machine uses a metallic bellows that eliminates cumbersome dead weights. The desired hydraulic pressure or load is built up in an accumulator by means of accurately regulated air pressure. Opening a toggle valve at the base of the bellows transmits this load to the soil sample without impact.

For further information write to the company, or use the Request Card at page 18. Circle No. 607.

New

LUFKIN MEZURALL

ENGINEERS' TAPE RULES

Now you can have an engineers' tape rule in the famous Lufkin Mezurall quality. Your choice of Chrome Clad (jet black figures against chrome white finish built up by multiple electro-platings — won't chip, crack or peel) or White Clad (jet black markings on durable snow white baked enamel). Blades ½" wide are replaceable.

Lower edges marked in feet, inches and 16ths. Upper edges marked feet, 10ths, and 100ths of feet.

New extra-strong feather-weight case on White Clad.

Self-adjusting end hooks for accurate butt-end and hook-over measurements.

	WHITE CLAD	CHROME CLAD
6 ft.	W926D	C926D
8 ft.	W928D	C928D
10 ft.	W9210D	C9210D
12 ft.	W9212D	C9212D

Available in 6, 8, 10 and 12 foot lengths

FREE — packed in re-usable box with "See-thru" hinged lid and snap fastener.

353

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FELKER DI-MET MODEL 100

a "budget-priced" concrete cutter for patchwork and repair jobs!

Let this low-cost 7½ h.p. concrete cutter help you on all maintenance and repair jobs! Light, powerful, easy to handle in tight spots. Blade mounts on either spindle end; lowers and raises hydraulically. Accessory coolant tank available for independent water source. Handles up to 12" blade diameters. Ideal for municipal use; meets budget requirements. Write for descriptive circular on the Model 100. Other DI-MET concrete cutters also available.

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World's Largest and Oldest Manufacturer of Diamond Abrasive Cut-Off Wheels and Machines

FELKER DI-MET SINCE 1924

Indispensable on-the-job for TOP PERFORMANCE

Dixie Cups

with cool refreshing water

- cuts loss of valuable time!
- cuts loss of efficiency!
- cuts down contagion, absenteeism!
- helps reduce fatigue accidents!

Special Dixie designs teach safety and caution!

DIXIE'S INSULATED WATER CARRIER

Keeps water cool for hours. Available with dispenser for Dixie Cups of your choice. Use in central location —or it's portable with shoulder straps.

SEND FOR FREE ILLUSTRATED BOOKLET! WRITE TO:

DIXIE CUP COMPANY, Easton, Pa.

Other plants at: Chicago, Ill., Darlington, S. C., Ft. Smith, Ark., Anaheim, Calif., Brampton, Ont., Canada

"DIXIE" IS A REGISTERED TRADE MARK OF THE DIXIE CUP COMPANY

Using the grizzly screen attachment, this Austin Overshot loader dumps screened gravel, ready for spreading, into the haul truck. Oversize material is deposited alongside the truck.

Overhead Tractor Loader With New Grizzly Attachment Screens Out Oversize Material As It Loads

■ A new grizzly screen attachment for all hydraulically operated Austin Overshot loaders is announced by the Austin Division, Central Ohio Steel Products Co., Galion, Ohio. With the new screen attachment, Austin loaders can dig, screen, and load pit-run gravel and other materials into trucks in one operation. The loaded gravel is ready for spreading on roads without additional screening, as oversize material is segregated and dumped alongside the truck.

The screen is being marketed in several sizes. Attached by eight heavy bolts and readily installed or removed, the screen attachment will also serve as an effective means of screening out fines when loading riprap or other coarse material.

The Austin Overshot hydraulic loader is available in capacities of 1 to 4 cubic yards for mounting on Caterpillar D2, D6, D7, and D8 tractors.

For further information write to the company, or use the Request Card at page 18. Circle No. 649.

Cement-Base Paint Keeps Masonry Walls Dry

■ A new ready-mix cement-base paint designed to prevent water seepage through masonry or cinder-block walls has been announced by A. C. Horn Co., Division of the Sun Chemical Corp., 10th St. and 44th Ave., Long Island City, N. Y. The feature of Waterfoil paint is that it may be applied to either a wet or dry wall without saturating the surface with water before and after application.

In addition, Waterfoil is reported to expand within surface voids into a cement-like coating which cures into a stone-like water barrier, permitting the underlying masonry to breathe while preventing the passage of water.

The paint withstands hydrostatic pressure of 500 pounds per square foot. It is applied with an ordinary whitewash brush and dries within 8 to 10 hours.

The moisture-resistant material is available in five colors: white, gray, green, rose, and buff.

For further information write to the company, or use the Request Card at page 18. Circle No. 692.

New 30"x26" Rolls

Greatest secondary crushing capacity ever offered in a plant of this weight

Giant Capacity

Gives you far more fine crushed material per hour. Has the ideal crusher for the big 4' x 12' screen

Universal 880 Senior "R"

10" x 36" Jaw • 30" x 26" Roll Crusher • 30" Conveyors • 48 sq. ft. Screen

You want a plant that delivers screened and crushed material at a record rate and produces it at lower cost per ton. This is it!

The 880 Senior "R" teams a huge 48 sq. ft. screen with the biggest roll crusher ever offered, big, rugged 30" conveyors and a high capacity 1036 jaw crusher to give you a plant unequalled for high production in its weight class.

It's easy and economical to operate, too. You can adjust the jaw discharge quickly while standing on the ground—insures full control over primary crushing at all times. Dual clutch control on delivery conveyor speeds up truck loading of finished material. Plant operator or truck driver can control conveyor discharge.

Add to this—trouble-free V-belt drive, head-drive front delivery conveyor, extended operator's platform, plus the dozens of other advanced Universal features . . . and you've got a big, profitable, easy-operating plant that can't be matched. Write for illustrated bulletin, today!

Universal Senior 880 "R"—designed to meet highway weight limitations

PETTIBONE UNIVERSAL
In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION
620 C Avenue N.W., Cedar Rapids, Iowa
A Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division St., Chicago 51, Illinois

Surveying experts favor
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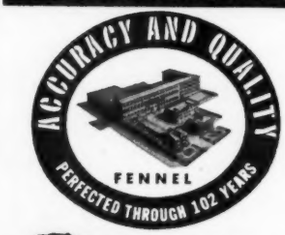

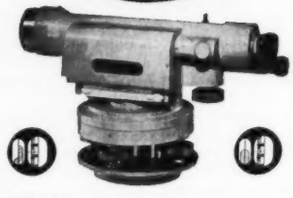

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Dealers in principal cities

Huffer risers are designed to eliminate the need for dislodging manhole covers after repaving.

Risers for Manhole Covers Compensate for Repaving

■ Segmental risers that may be used for adjusting the height of manhole covers to compensate for blacktopping or any other rise in the street grade have been developed by Huffer Foundry Co., Warsaw 2, Ind. With the special risers, the need for dislodging manhole covers is eliminated.

The risers are placed end to end to form a circle or ring. This sectional ring rests on the shelf or bearing surface which normally supports the lid, the offset portion of the riser resting on the manhole frame. A shelf formed by the risers supports the manhole lid at the newly established height. After asphaltic or concrete-paving material has been placed around the ring of risers, they are held securely.

The Huffer manhole risers are designed to fit covers 21 to 26 inches in diameter. Minimum rise is 2¼ inches and heights increase in increments of ¼ inch. The riser segments are made of high-quality gray iron.

For further information write to the company, or use the Request Card at page 18. Circle No. 665.

Folding Steel Barricades

■ A complete line of folding steel barricades is available from All-Craft Mfg. Co., 5035 N. 124th St., Butler, Wis. Made in models from 4 to 10 feet long, the barricades have heavy-gage-steel top members with steel legs. The legs fold into the tops to provide compact easily-handled units.

According to the manufacturer, two of the barricades can be easily carried and set up by one man. The legs lock in place.

Carrying handles and lantern hooks are welded into the top members and holes are provided for attaching electric flasher lanterns. Finished in glossy pavement yellow, either plain or striped, the barricades are reported to be easy to see under any light.

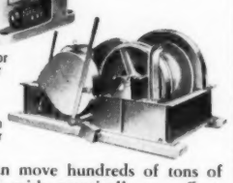
The manufacturer states that they are competitive with wooden barricades in first cost and that their longer life and single-unit construction make them more economical.

For further information write to the company, or use the Request Card at page 18. Circle No. 738.

Made with legs that fold into the top cross member, All-Craft steel barricades are easy to carry and set up.

"Superior" Electric Carpullers

CAPSTAN TYPE, DRUM TYPE AND SPECIAL TYPES



Model SC Superior Capstan Carpuller

Model EP Drum Type Carpuller

One man can move hundreds of tons of rolling load with practically no effort. Economical, efficient, Carpullers are available for your specialized requirements.

Write for bulletins and catalogs!

Designed and Manufactured by

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Main Office and Works: SUPERIOR, WISCONSIN, U. S. A.
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Adams TraveLoader

Loading surplus ditch and shoulder material on a road job

Loading gravel from stockpile on a contract job

Loads with equal speed and efficiency from both windrows and stockpiles

For high-speed loading, at low cost—from either windrows or stockpiles—you'll find the *All-Purpose* Adams TraveLoader in a class by itself.

On road and street jobs, the TraveLoader picks up and loads surplus windrowed material — dirt, sod, scarified material, snow, etc.—at better than a truck-a-minute clip . . . and does it without interrupting regular flow of traffic.

The TraveLoader handles stockpile loading with equal speed and efficiency, whatever the material—gravel, sand, crushed stone, slag, etc. . . . sends trucks on their way in jig time with full, well-balanced loads.

The TraveLoader's superior performance stems from a host of advanced features, such as **High-Speed, Full-Floating Feeder — Adjustable Conveyor — High, Centrally-Located Cab—Wide Range of Working Speeds.**

Ask your Adams dealer to show you how the TraveLoader will step up production and cut costs on your jobs.

ADAMS DIVISION • LeTourneau-Westinghouse Co., Indianapolis, Ind.

ADAMS

Motor Graders TraveLoaders Pull-Type Grad

Border Machinery Co. gives the buyer what he wants

Border's spacious headquarters at 1710 Paisano Drive, on the outskirts of El Paso, Texas, is the hub of all its sales and service activities covering counties in southern New Mexico and western Texas.

Eight years ago there were only 17 International Harvester crawler tractors within a 250-mile radius of El Paso, Texas. Today, the area has almost 500 such units—a number of them TD-24's. While contractor's purchases of equipment can be attributed to a rise in construction work in the territory, much of the credit for I-H sales goes to the Border Machinery Co.'s emphasis on service in its sales program.

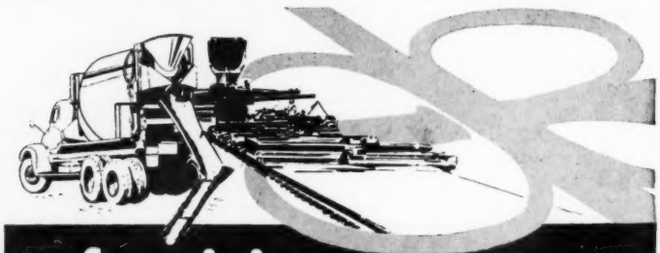
Operating on the policy that "you don't deserve a man's business unless you're interested in helping him solve his problems," president T. P. Gentry, along with his group of salesmen, has parlayed the El Paso firm into a $2,500,000 annual business in the space of seven short years.

The actual development of Border goes back much further, starting between 1938 and 1941—years when Gentry worked as a parts man and delivery agent for what is today a competing firm. This job, which Gentry held after completing his schooling, gave him not only an introduction to the distribution business but also an opportunity to observe customers and to find out what they wanted from a dealer.

The second important step, for Gentry and Border, came when Gentry served with the Seabees in the South Pacific during World War II. During this time, he was assigned to the repair and upkeep of heavy construction machinery. This work and his experience with the dealer tied into each other naturally, and soon after the war Gentry found himself a key member of Hardin & Coggins, the newly formed International distributor in El Paso. And when this firm decided to open an El Paso branch in 1946, Gentry took the next logical step forward.

New Territory

The new territory, including the 10 southern counties of New Mexico and all the Texas counties west of the Pecos River, presented enormous possibilities for development. Practically every type of construction goes on in this area, much of it the year round. In addition, ranching and heavy agriculture is practiced in all the principal river valleys. The Hobbs district in southern New Mexico has rich oil fields. The mountainous country near Silver City is an important mining district. Potash mines are located near



for sizing accuracy
Specify GILSON

The GILSON Mechanical Testing Screen provides an accurate check on sizing specifications for crushed stone, gravel, slag, coal, ores, and all similar materials.

RUGGED, FAST, AND ACCURATE
HANDLES UP TO ONE CU. FT. OF SAMPLE
MAKES TEST IN 5-MINUTES OR LESS

A GILSON Test Report from a supplier is a guarantee of right quality. On-the-job testing with GILSON cuts out errors and guesswork, saves time and money.

Specify GILSON and get what you want on every job

Write for additional information

Here's why GILSON belongs in your sizing specifications:

1. Makes tests quickly and accurately
2. Two to seven separations simultaneously
3. Screen trays independently removable
4. Trays balanced to same tare weight
5. Visible separation to refusal
6. Few moving parts
7. Sturdy construction
8. Size range 4" to 200-mesh

A Sand Attachment for handling 8-inch sieves is optional equipment with the GILSON Screen.

—JUST ATTACH THIS COUPON TO YOUR LETTERHEAD—

GILSON SCREEN CO.
Malinta, Ohio

NAME

TITLE or POSITION

Please send me further descriptive and price information on the GILSON Mechanical Testing Screen.

Only $15.95*
IDEAL
Electric Marker

Cuts a Permanent Mark Into Any Surface—from Steel to Plastics and Glass

Easy to Use as a Pencil!

ORDER TODAY
*hardened alloy point
$21.40 with diamond point
F.O.B. Sycamore, Illinois
SEND NO MONEY!
Delivery made through your nearby IDEAL Distributor
PRICES APPLY U.S. ONLY

Dozens of cost-cutting, time-saving uses in every plant. Can be used anywhere, by anyone on any material. Codes, identifies parts, tools, jigs, etc. Cheaper than special plates, better than tags. 7200 cutting strokes a minute, adjustable for depth, make tamper-proof mark that lasts for ever.

IDEAL INDUSTRIES, Inc.
1366 Park Ave., Sycamore, Illinois
Please enter our order for the following IDEAL Electric Markers

Quantity
____ Alloy Point @ $15.95
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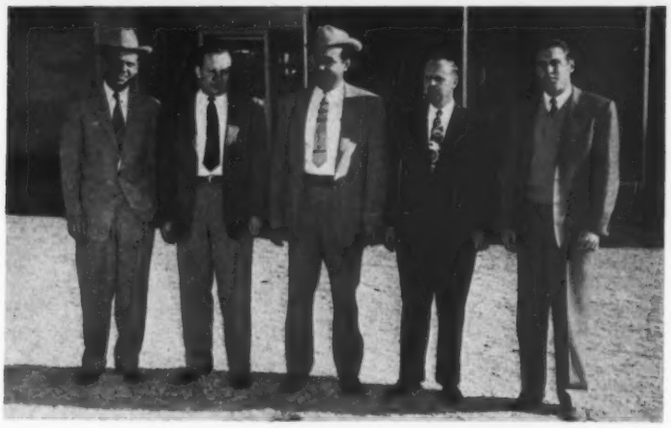
Name_____
Company_____
Address_____
City_____ Zone____ State____

Emphasis on top-notch service brings customers back, making sales skyrocket for active southwest dealer



The drive behind Border operations is provided by, left to right: H. K. Hughes, sales manager; Bob Gilmore, parts and supply manager; T. P. Gentry, president; L. H. Strain, secretary-treasurer; and his assistant Joe Rector III.

Ray Day Photo

Carlsbad. A sizable lumber industry is located in the timber country near Cloudcroft, N. Mex. All these operations require the use of heavy construction equipment.

By 1948, Gentry had helped push sales and service to the point where Border Machinery was able to organize on a $200,000 capitalization. Two years later, a most impressive machinery-headquarters building had been built at the eastern edge of El Paso at 1710 Paisano Drive, the city's new expressway. Covering four acres, the dealer facilities have 21,640 square feet of space under one roof, and 10,500 square feet of space in another building.

Gentry, after analyzing the territory's needs and the capacity of his firm, made the firm a combination industrial and agricultural distributor for I-H. Most of his other accounts tie in well with this setup. For the industrial field, Border handles Adams, Jaeger, Bucyrus-Erie, Hough, Littleford, Cleveland, Broderick-Bascom, Drott, Thor, Wayne sweepers, Goodyear rubber products, and a number of other equipment and supply lines. The company also holds the west Texas franchise for Apache explosives manufactured at Benson, Ariz. In addition, the entire I-H agricultural line, Atlas deep plows, and a wide variety of land-tilling equipment are sold and serviced by the firm.

"First in Customer Service"

The importance of the customer, and of his good will toward the firm, is given concrete, expression in the company's motto, "First in customer service". While taking the fact for granted, Border personnel pride themselves on being available for service calls 24 hours a day. This kind of service has made contractors confident that if equipment is down, a call or trip to El Paso will result in the machine being back on the line within a short time.

One of the company's more unusual services is provided by a parts-stocked service truck which cruises throughout the agricultural area during the busy periods of the planting and harvesting season. The truck is equipped with a radio telephone so that a service call coming into the dealer's headquarters can be relayed to the truck immediately. This truck then goes directly to the customer to replace the part and get the equipment back in operation. The few parts not stocked by Border for agricultural or construction machines are available from factories on short notice.

All of the company's services are supplemented by the dissemination of maintenance and operating information. And all this work on the part of the dealer pays off. Customers, knowing that Border is trying to assist them in keeping machines working and earning a profit, invariably return to the dealer's headquarters when new purchases are to be made.

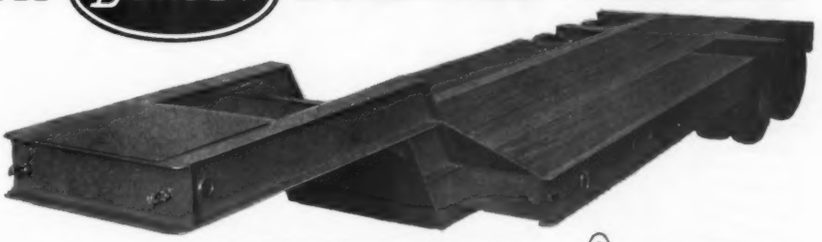
Organization

In recruiting Border's staff, Gentry selected his key personnel not only on the basis of their personality and age, but also on their experience in the machinery business. All of these people were well acquainted with the good and bad points of equipment they had sold in the past, for Gentry

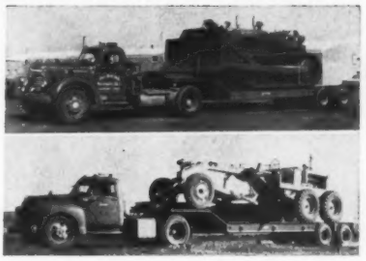
(Concluded on next page)

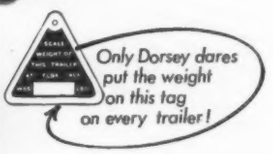
So Light, to be so Strong

THE NEW DORSEY LOW BED TRAILER



Now, a 20-ton trailer weighing only 8,250 pounds cuts operating costs and gives busy heavy haulers more loads within legal limits. High tensile steel main channels and close-spaced all-welded cross members give extra strength to the Dorsey HTS series of low bed trailers also available in 15, 25, 30 and 35-ton capacities. Flat-type gooseneck steps up efficiency and versatility. Wheels in tandem "walk" on stub axles over rough terrain, pull easily on highways.



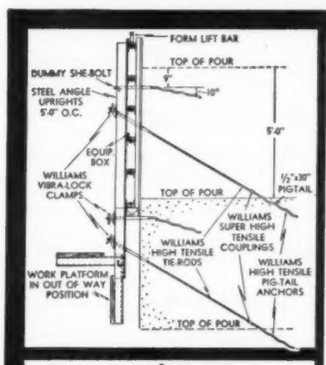


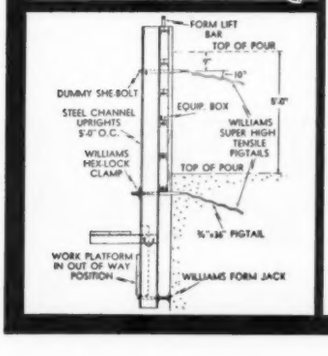
Typical loadings show versatility of flat-type gooseneck Dorsey HTS low bed trailers which are delivered ready for work with brakes, recessed lights, tool box as standard equipment. Grader ramps are optional at extra cost.

DORSEY TRAILERS SALES-SERVICE

SEE YOUR DORSEY DISTRIBUTOR OR CONTACT

DORSEY TRAILERS ELBA, ALABAMA





PIONEER MANUFACTURERS OF CONCRETE FORM HARDWARE

WILLIAMS FORM ENGINEERING CORP.

MAIN OFFICE — MADISON and GARDEN STS. • PHONE 5-9209 • GRAND RAPIDS 7, MICH.
WESTERN OFFICE — 751 N. E. LOMBARD ST. • PHONE TW-6453 • PORTLAND 11, OREGON

Bob Rankin, in charge of the injection and magneto room at Border, adjusts an injector pump. All the company's shops and offices are centralized in two buildings having a total of 32,140 square feet of space.

Ray Day Photo

(Continued from preceding page)

felt it was important for his personnel to know about competing lines. In a rush or emergency, every man in the organization pitches in to double up on important jobs. Even Gentry will man the parts desk, help out with a sale, or assist the business office with a financial problem during these times.

Along with Gentry and H. K. Hughes, sales manager, the organization is composed principally of young people. Department heads include L. H. Strain, secretary-treasurer, and Joe Rector III, his assistant. Ralph Peters is industrial service manager; Robert Gilmore, parts and supply manager; and Welton Noble, agricultural service manager. Four salesmen with Border, all with a number of years' experience in the field, are A. V. Gunn, J. D. Rickman, W. L. Rose, and Jack Evans.

One of the most important men in the organization is S. L. Humble, who delivers all new equipment, handles all demonstrations, and acts as liaison man. Long an equipment operator, Humble can handle units in every line sold by the company.

Shop Setup

Customer service is also emphasized by the location of Border's headquarters. Situated near the eastern limits of El Paso, the company's shop and showroom are easily accessible to customers. A convenient loading dock simplifies the job of accepting equipment for repair or loading units for delivery. The huge yard on the four-acre plot is organized for the storage of new and used equipment. And though Border's sales and service personnel have to travel several hundred miles out of the headquarters city, the area's good highways permit the needs of the territory to be easily analyzed. Border's salesmen know at all times the major construction jobs which may need equipment.

One of the two buildings on the property is a 21,640-square-foot structure containing sales rooms, administrative offices, conference room, parts shop, heavy-repair shops, steam-cleaning room, painting room, and generator and injector room. A cantilevered structural steel roof on the north side of the building shelters a large open work area where much equipment repair work is done.

Precision work on fuel injectors, magnetos, and electrical parts is done in the clean and orderly injector service room, with Bob Rankin in charge of repairing this equipment to meet factory standards. Added importance

Here is the Adnun Jr. starting the fourth course from the curb on a parking lot. On each course the Adnun put itself in position under its own power, ready for the truck. Truck time was reduced, back breaking labor was eliminated and the cost of the job was less.

The Adnun Jr. is the only tow-type bituminous paver that brings you the advantages of engine power for moving the empty paver on the job. In close quarter work, up against garage doors, inside of walls, close to buildings, in fenced playfields and similar work, Adnun power is an invaluable time saver and cost reducer. It eliminates much hand work, cuts down on manpower and makes possible a better job.

If you are bidding on non-highway specification work, the Adnun Jr. will permit better bids and give longer, trouble-free service. Ask for details on this high-quality tow-type rig.

- Maneuvers for new location under power.
- Demountable Tow Hitch eliminates need for trailer.
- Simple design.
- Oscillating Screed assures tight longitudinal joints.
- Dual controls on either side.
- Breaker Bar gives better compaction.
- Anti-Friction Bearings throughout.
- Continuous Course Correction for more accurate leveling.

BLAW-KNOX COMPANY
CONSTRUCTION EQUIPMENT DIVISION
1916 State Street
Nunda, New York
BLAW-KNOX

ADNUN JR
MODEL 8
BLACK TOP PAVER

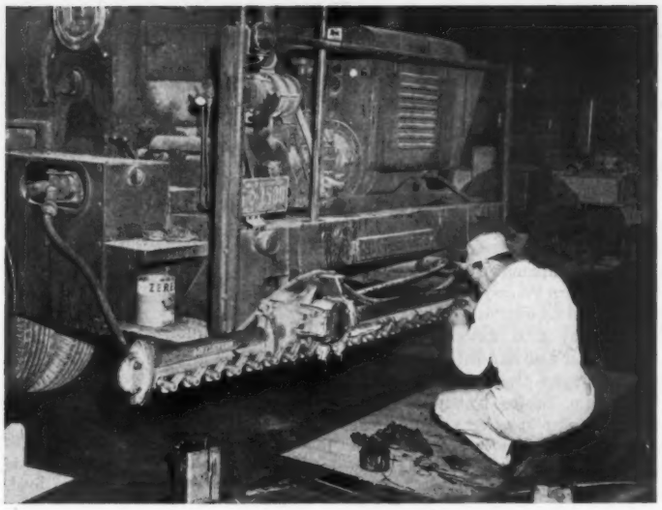
SOIL AIRE
ROLLPAC
Ruggedly built for heavy-duty service

Detachable Outside Edger Wheel. Rolls flush with curb or wall.

$895.00

A Standout Popular-Priced One Ton Roller. Send for Catalog.

SOILAIRE INDUSTRIES
Minneapolis 3, Minnesota
Sold by over 75 distributors in United States and Canada



A Littleford asphalt distributor owned by the New Mexico State Highway Commission is repaired by one of the company's mechanics. *Ray Day Photo*

is given to cleanliness—particularly when work is being done with fuel and oil filters — since fine dust churned up by the area's high winds presents a special hazard to equipment. This condition is at its worst in the late winter and early spring, when plowing and grading work are reaching their peak.

Perhaps the best illustration of the efficiency and skill of the company's mechanical force is the fact that Border manages to keep a government repair-overhaul contract going full time. Government inspectors, on hand when mechanics work on state-owned equipment, are invariably satisfied with the consistently good job which the mechanics consider routine.

Right now, Gentry and his force are keeping an eye on the greatest potential surge in private and industrial construction in Border's territory. Work in soil conservation and reforestation, the company feels, is just beginning. And there are indications that the building boom in El Paso and other cities will go to even greater heights. While the old days of a seller's market are definitely over, the company is counting on International's introduction of a complete new line of farm tractors and the operator comfort stressed on the industrial line to spur sales. All this, plus Gentry's confidence that the measure of stabilization achieved to date in the construction industry will remain for some years, is making Border personnel optimistic about 1955. THE END

New Chain Belt Dealers

Exclusive distributorship of Rex construction machinery has been granted to Riney-Ryan Tractor Co., 3350 Morganford Road, St. Louis, Mo., by the Chain Belt Co., Milwaukee, Wis.

The new dealer will handle Rex Moto-Mixers, Speed-Primer pumps, and other products in the line in all counties south of and including Calhoun, Jersey, Madison, Bond, Fayette, Effingham, Jasper, and Crawford in Illinois. It will also serve Missouri counties east of and including Schuyler, Scotland, Knox, Shelby, Monroe, Audrain, Callaway, Osage, Pulaski, Texas, and Howell.

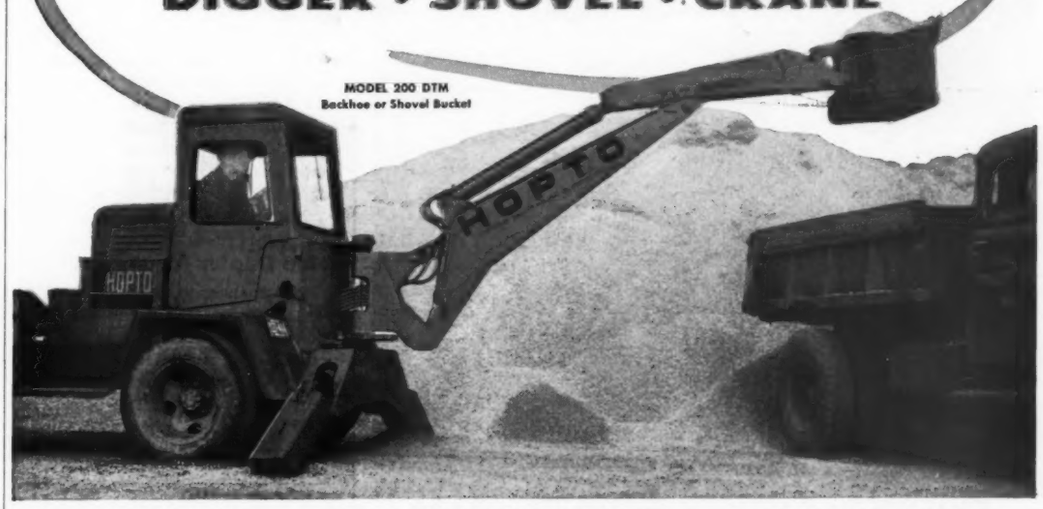
Nesbitt Equipment Co., 451 Calvert Ave., Alexandria, is exclusive distributor of the same equipment in Montgomery and Prince George's County

get set for more work with lower equipment investment

HOPTO

DIGGER • SHOVEL • CRANE

MODEL 200 DTM
Backhoe or Shovel Bucket



FAST CYCLING . . . HYDRAULICALLY OPERATED . . . EASILY MASTERED!

HOPTO Model 200 DTM illustrated above mounts on any 1½ ton or larger truck. This low-cost, big-capacity, versatile unit gives you a power shovel, crane and backhoe at *low equipment investment!*
HOPTO is completely hydraulic. Four levers give fatigue-free operation of this fast-cycling, 200° swing unit. The dipper stick extension mounting on the bucket gives 135° tilt. HOPTO digs 11½ feet below surface; lifts 13½ feet high with shovel bucket, more than 9 feet high with backhoe.
Alloyed steel hardened pins and self-aligning bearings at all pivot points, magnetically filtered oil, double wire braided hydraulic hoses and the elimination of all cables, sheaves and pulleys assure longer life, lower maintenance!

MODELS FOR EVERY NEED!

Badger manufactures a complete line of earth digging equipment from the large capacity, continuous Badger Trencher to the following models of the HOPTO Digger: Power take-off operated and self-powered trailer-type models, two models for mounting directly on any 1½ ton or larger truck, models for rear mounting on track-type of wheel-type tractors, a complete self-propelled track-type unit and the complete Model SPR unit shown below. All HOPTO units incorporate the completely hydraulic operation and the heavy-duty engineered features that make HOPTO the standard of comparison!
A wide variety of attaching equipment adapts HOPTO for any shovel or backhoe work. Half shell and skeleton type buckets and backhoes are available in a variety of widths for every application. Buckets are equipped with HL teeth.
Get all the facts and you'll get HOPTO!

BADGER MACHINE CO.
DEPT. E, WINONA, MINN.

WRITE FOR FREE FOLDER GIVING COMPLETE INFORMATION

MODEL 185 SPR
Backhoe or Shovel Bucket

When it comes to pumps—

there are none like NOVO! Both the NOVO Self-Priming Centrifugal (from $78) and the NOVO Diaphragm (Single and Double from $330) have been setting quality and performance standards for the industry since 1903. Write or Wire Now For Price List, Specifications, Further Information. Or for details of a few choice Distributorships which are still open. The Novo Pump & Engine Company, Lansing 5, Michigan.

CE-01

in the District of Columbia, as well as Accomac, Arlington, Clarke, Fairfax, Frederick, Loudoun, North Hampton, and Prince Williams counties in Virginia.

Bode-Finn Co. Opens Branch in Columbus

An additional branch has been opened in Columbus, Ohio, by the Bode-Finn Co., 2650 Spring Grove Ave., Cincinnati, Ohio. The new facility will handle sales and service of Hyster fork-lift trucks, Michigan power shovels and cranes, and Clayton industrial steam generators.

William Ransom, former Cincinnati sales manager, is manager of the branch, and James Sadler is service and parts manager.

In other changes, Albert H. Bode, secretary-treasurer, has been made director of sales of the company's industrial division. George Vetter has been made assistant to George Blout, general manager of all operations, and John M. Harrod, vice president, is manager at Dayton, Ohio.

Madsen Distributor Named

The line of asphalt-paving plants made by Madsen Iron Works, La-Mirada, Calif., is now being handled by Allied Equipment Corp., Carnegie, Pa., in western Pennsylvania. The distributorship, located at 1 Glass Street, is headed by A. N. Patterson.

The dealer also handles Galion rollers and graders, Unit equipment, Trojan loaders, Dorsey trailers, Temple stone and chip spreaders, Bethlehem wire rope, U.S.F. culvert pipe, Miller asphalt spreaders, and Sicard and Good Roads snow-clearing equipment.

The popularity of Sally Zippert's caricatures in *CONTRACTORS AND ENGINEERS* hospitality room at the 36th annual AED convention in Chicago proved that equipment dealers have a lively sense of humor—particularly about themselves. Here she gives an added fillip to her impression of G. A. Sandberg, Sandberg Equipment Co., Cambridge, Mass. *Elliott Robinson Photo*

Shepherd to Build Large New Facility

Shepherd Machinery Co., Los Angeles, Calif., formerly Shepherd Tractor & Equipment Co., is planning construction of new facilities on a 34-acre site near Whittier, Calif. The new plant will have more than 110,000 square feet of enclosed area for display, sales, and parts and machinery service.

The company, which remains in the hands of the former owners, will serve Los Angeles, Orange, and Inyo counties from the new headquarters at San Gabriel River Freeway and Cliota Street. W. W. Shepherd is general manager of the organization, a dealer for Caterpillar, John Deere, and allied equipment.

Ohio Dealer for Galion

Maintenance, parts, and installation service on Galion Allsteel dump bodies and hydraulic hoists is being provided for the central and southern Ohio area by Acme Spring & Equipment Co., Columbus. The dealer, at 385 E. Livingston Avenue, is the newest outlet for The Galion Allsteel Body Co., Galion, Ohio. G. H. Williamson and R. S. Arthur are partners in the dealership.

East Coast Distributor

Rubarite, a synthetic rubber product for rubberized asphalt paving, is being distributed on the east coast by Borne, Scrymser Co., which operates plants in Elizabeth, N. J., and Charlotte, N. C. The product is made by Rubarite, Inc., Magnet Cove, Ark., a company owned by The Goodyear Tire & Rubber Co., Akron, Ohio; The National Lead Co., New York, N. Y.; and Bird & Son, Inc., East Walpole, Mass.

Leland Adds Salesmen

Five salesmen have been added to the staff of Leland Equipment Co., Tulsa, Okla. Philip B. Davidson, G. R. Werner, Burton Dicks, Thomas A. Robertson, and Claude J. White will now handle truck body and construction-machinery sales throughout the mid-continent and surrounding state area.

POWERFUL • RELIABLE • ECONOMICAL

This powerful turbo-supercharged Waukesha is a twelve-cylinder, 60-degree vee, even firing, four-cycle, solid injection, overhead valve, compression ignition Diesel, of 8½-inch bore and stroke and 5788 cubic inch displacement. The connecting rod arrangement is of the side-by-side type; opposing pistons operating from a single wide-area crankpin.

The turbocharged Diesel unit shown above develops approximately 1100 hp at 1200 rpm with radiator, fan, and air cleaners. Without turbocharging, the normal Diesel complete unit maximum rating is 800 hp. The propane-butane model of this V-12 series develops 870 hp. Bare engine ratings of all models are higher. Response to throttle and load requirements is quick and smooth, with a fast surge of reserve power for emergency and overload demands.

Tremendously powerful, remarkably rugged, this V-12 engine is designed for simplicity and reliability. Major parts are interchangeable between right and left cylinder banks. Main and rod bearings are easily accessible. Strength, precision and balance are built into all elements of the power train, from pistons to flywheel. Supporting members are designed for extreme rigidity and perfect alignment of moving parts.

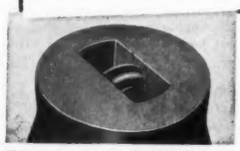
Send for illustrated Bulletins 1663 (turbocharged)—1664 (normal Diesel)—1656 (gas).

266

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
New York • Tulsa • Los Angeles

Frederick
CAST SEMI-STEEL
BALLS

Your low cost production tool for
■wrecking old buildings ■smashing scrap metal
■smashing old paving ■secondary quarry breakage



Exclusive E-Z SWING steel eye, deeply imbedded in ball, gives better control; more cable protection. Special Release Hooks for "free dropping" also available.

Tough and rugged, they're made to stand abuse without maintenance cost. Made in sizes to suit your needs. Prompt shipment F. O. B. Frederick, Md., from stock. Write today for free illustrated literature and prices on Frederick Balls and Weights that save your production costs.

SIZES AND WEIGHTS SHIPPED FROM STOCK		
500 lbs. (ball-shaped)	2000 lbs. (ball-shaped)	5200 lbs.
1000 lbs.	3300 lbs.	6500 lbs.
1500 lbs.	4000 lbs.	8000 lbs.

MAKERS OF MANHOLE FRAMES, COVERS AND STEPS
• STORM GRATINGS • METER FRAMES AND COVERS
• CENTRIFUGAL PUMPS • GRAY IRON CASTINGS

FREDERICK IRON & STEEL, INC.
FREDERICK, MARYLAND

LeTourneau-Westinghouse Presents Dealer Awards

Grouped around John W. Schoen, center, vice president and general manager of LeTourneau-Westinghouse, are winners of the 1954 distributorship awards. Standing left to right, are R. E. Dickerson, S. D. Means, Al Chappell, Mr. Schoen, J. P. Costello, Frank A. Davis, and D. Braxton Blalock.

Presentation of awards to five distributors for outstanding sales records was the main event of the Distributor Day banquet given by LeTourneau-Westinghouse Co., Peoria, Ill.

Awards were presented to R. E. Dickerson, branch manager, and S. D. Means, vice president, respectively, of Illinois Contractors' Machinery, Inc., Melrose Park, Ill., as top eastern-area distributor. Al Chappell, secretary and sales manager of Crook Co., Los Angeles, Calif., accepted the award for his company, the top western-area distributor. John P. Costello, vice president and managing director of Costello Equipment Co., Inc., Calgary, Alberta, Canada, accepted the runner-up award for the western area. The award for H. F. Davis Tractor Co., Boston, Mass., second in the eastern area, was presented to Frank A. Davis, president. D. Braxton Blalock, Jr., of Blalock Machinery & Equipment Co., Atlanta, Ga., accepted the top wire-rope distributor award.

Distributors from the U. S. and Canada attended the one-day meeting in Peoria.

Foster-Bell to Handle Complete Koehring Line

The line of Koehring heavy-duty construction equipment will be handled in the state of South Dakota by the Foster-Bell Co., 1001 E. 14th St., Sioux Falls. The new dealer succeeds Sioux Road Equipment Co. as the area's Koehring representative.

Foster-Bell is headed by John P. Foster, president and treasurer. Gorden H. Bell is vice president and secretary, and Norman Wilson is sales manager. The firm will also handle products made by the three Koehring subsidiaries, C. S. Johnson Co., Champaign, Ill.; Parsons Co., Newton, Iowa; and Kwik-Mix Co., Port Washington, Wis.

Llewellyn Named Dealer For Euclid in Florida

Service and sales on Euclid earth-moving equipment is being handled in southern Florida by Llewellyn Machinery Corp., 1030 N. Miami Ave., Miami, the newly appointed dealer for the Euclid Division of General Motors Corp., Cleveland, Ohio. James L. Llewellyn is president of the equipment firm and Charles B. Schry, Jr.,

(Concluded on next page)

Cut Welding Costs with this **Contractor Special** welder

Welds anywhere!

Do the job faster, better with Hobart. You'll avoid time-consuming breakdowns that delay the job and roll up cost.

Hobart Gas Drive Welders are used anywhere to fabricate steel or repair equipment. No need for power—they provide their own. A type and size for every construction job—large or small.

Many contractors standardize on the 250 amp "Contractor Special." A full capacity 250-ampere welder, yet compact and lightweight for easy moving from job to job.

Others like the combination AC Arc Welder and AC Stand-by Power Unit. Welds or powers lights, tools.

For extra heavy duty welding, contractors favor the Hobart DC Gas Drive Welders ranging up to 600-ampere capacity with many combinations of auxiliary power.

Check and return the coupon today for complete details!

"Contractor Special" 250-amp Gas Drive Arc Welder.

AC Arc Welder-AC Stand-by Power Unit.

Heavy duty Gas Drive DC Arc Welder.

HOBART TROY OHIO WELDERS

Tear off and MAIL TODAY!

HOBART BROTHERS CO., Box 845, Troy, Ohio, U. S. A. Telephone 21223

Without obligation, please send information on items checked.

☐ "Contractor Special" DC Gas Drive Welders ☐ AC Arc Welder-AC Power Unit ☐ Electrode samples for_____

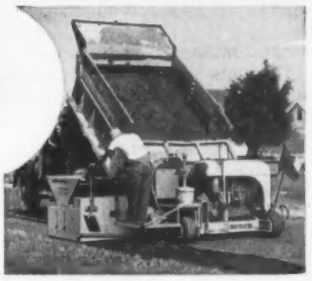
NAME_____ POSITION_____

FIRM_____

ADDRESS_____

BURCH
ROAD WIDENER
(PATENTS PENDING)

- For 2 ft. to 4 ft. standard widening.
- 4-speed conveyor belt.
- Will empty its hopper as fast as you can fill it.
- Equipped with BURCH exclusive truck coupler and special BURCH adjustable truck hitch.
- Applicable to any standard dump truck.



Write Dept. CE for literature.

The BURCH Road Widener is attachable to any truck. Built-in conveyor, which is driven by heavy industrial gas motor, will deliver material where required. It will handle sand, gravel, stone, or bituminous material. Self-propelled and steered by hydraulic equipment. A high speed unit unexcelled in road construction.

The BURCH Corporation
CRESTLINE, OHIO, U.S.A.
MANUFACTURERS OF EQUIPMENT FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND STREETS

Let us put all the facts into your hands

Write for CATALOG NO. D-5415

...and at your fingertips you'll have important data on the champion producer of aggregate

DIAMOND "77"
CRUSHING AND SCREENING PLANT
Sets Performance Records Wherever It Works

This mobile unit is without a peer in either strength or in aggregate producing ability. Learn how Diamond's line-flow, rotor-lift principle can give you high crushing capacity and uninterrupted flow of material.

Write us now for name of the Diamond Distributor in your territory. Find out how you can increase production and profits.

Everything for the aggregate producer

DIAMOND IRON WORKS
division
GOODMAN MANUFACTURING COMPANY
Halsted Street and 48th Place • Chicago 9, Illinois

(Continued from preceding page)

general manager.

In addition to the Euclid line, the company offers parts, sales, and service on Bucyrus-Erie, Jaeger, and other makes of equipment.

New Hensley Dealer

Crook Co., 2314 N. Chester Ave., Bakersfield, Calif., is a new exclusive distributor for Hensley Equipment Co., Inc., San Leandro, Calif. The dealer will handle the line of dozer and scraper rippers, dozer brush rakes, bottom track rollers, cutting edges, and allied tractor parts.

Ribble Is Lima Dealer

N. C. Ribble Co., Albuquerque, N. Mex., is a new dealer for shovels, cranes, draglines, and pull shovels manufactured by Baldwin-Lima-Hamilton Corp., Lima, Ohio. The company, with headquarters at 1304 N. Fourth St., will cover a large section of New Mexico.

Cleaver-Brooks Dealer

Ruffidge-Johnson Equipment, Inc., Minneapolis, Minn., has been appointed a dealer for boiler equipment made by Cleaver-Brooks Co., Milwaukee, Wis. The distributor, located at 3024 Southeast Fourth St., Minneapolis, will cover eastern Minnesota and fourteen Wisconsin counties.

Four Union Chain Dealers

Four distributors have been appointed to handle Galanot tire-tracks manufactured by The Union Chain & Mfg. Co., Sandusky, Ohio. In Indianapolis, Reid-Holcomb Co., Inc., 1815 Kentucky Ave., is the new dealer. Yukon Equipment, Inc., 327 Coleman Bldg., Seattle, Wash.; Rayall Co., 1580 N. E. 123rd St., North Miami, Fla.; and W. D. Mathews Machine Co., 279 Center St., Auburn, Me., are the other dealers.

CONVENTION CALENDAR

April 11-13 Wire Reinforcement Institute

Annual Spring Meeting of Board of Directors, Greenbrier Hotel, White Sulphur Springs, W. Va. Frank B. Brown, managing director, WRI, 1049 National Press Bldg., Washington, D. C.

April 11-14 Purdue Road School

Forty-first School, Memorial Union Bldg., Purdue University, Lafayette, Ind. Ben H. Petty, professor of highway engineering, Civil Engineering Bldg., Purdue University.

April 11-15 Greater New York Safety Council

Meeting Hotel Statler, New York, N. Y. Paul F. Stricker, executive vice president, GNYSC, 60 E. 42nd St., New York, N. Y.

April 11-16 Concrete Reinforcing Steel Institute

Annual Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. H. C. Delzell, managing director, CRSI, 38 S. Dearborn St., Chicago 3, Ill.

April 13-14 Earth-Moving Industry Conference

Conference, Pere Marquette Hotel, Peoria, Ill. Harlow N. Piper, designer, Engineering Department, Caterpillar Tractor Co., Peoria.

April 13-15 American Society of Lubrication Engineers

Meeting, Sherman Hotel, Chicago, Ill. W. P. Youngclaus, administrative secretary, ASLE, 84 E. Randolph St., Chicago 1, Ill.

April 13-15 American Wood Preservers Association

Meeting, Jefferson Hotel, St. Louis, Mo. W. A. Penrose, secretary-treasurer, AWPA, 839 17th St. N. W., Washington 6, D. C.

April 13-15 South Dakota Highway Short Course

Short Course of Instruction, Union Bldg., South Dakota State College campus, Brookings, S. Dak. Emory E. Johnson, professor of civil engineering, South Dakota State College.

April 18-19 American Institute of Steel Construction

Seventh Annual National Engineering

300,000,000 GALLONS OF WATER IN 15 DAYS—That's the record four dependable, trouble-free Marlow Self-Priming Centrifugal Pumps set when they dewatered the *world's largest natural drydock* at Grassy Point, New York. The contractor, Merritt-Chapman & Scott Corporation of New York City, barge-mounted the four 10" engine-driven Marlow Contractor's Pumps to speed the lake drainage job and finish the project *three days ahead of schedule!*

marlows are dependable!

Bidding on construction jobs is getting more and more competitive. That's why contractors make doubly sure cost and time estimates are right, to get the job and show a profit. When it comes to pumping, dependable Marlow Self-Priming Pumps never let them down . . . work goes through on schedule. For complete data on AGC rated pumps and Marlow "Mud Hogs," see your Marlow dealer or write for Bulletin C-52.

IF YOU WERE BUILDING THE
Air Force Academy
at COLORADO SPRINGS
Wouldn't You Use
ArroPanel Buildings
For your storage buildings, shops and headquarters offices?

Here's Why . . .

1. Custom-built to your individual requirements.
2. Panel construction for fast, economical erection.
3. Insulated for comfortable year 'round use.
4. Wide selection of interior and exterior coverings.
5. High tensile all-bolted construction.
6. Complete reusability on another project.

For Details—Write, Wire or Call

ARROWHEAD STEEL BUILDINGS, INC.
303 Garfield Ave., Duluth 6, Minn.
Telephone RAndolph 7-5016

CONTRACTORS AND ENGINEERS

Conference, Hotel Muehlebach, Kansas City, Mo. T. H. Hendrix, executive secretary, AISC, 101 Park Ave., New York, N. Y.

April 18-19 Building Research Institute

Fourth Annual Meeting, Woodrow Wilson Hall, Princeton University campus, Princeton, N. J. Charles R. Koehler, editor, "Building Science Reporter," Building Research Institute, 2101 Constitution Ave., Washington, D. C.

May 5-6 The Society of American Military Engineers

Thirty-fifth Annual Meeting, Waldorf-Astoria Hotel, New York, N. Y. Eugene McGovern, convention chairman, Office of the Secretary, SAME, 10th floor, 356 Broadway, New York 13, N. Y.

May 6 Conference for Engineers

Second Annual Conference, Ohio State University campus, Columbus, Ohio. Harold A. Bolz, associate dean, College of Engineering, Ohio State University.

May 12-13 Symposium on Automation

Centennial Symposium, Sponsored by School of Engineering, Michigan State College, on college campus, East Lansing Mich. Professor W. I. Kenerson, Department of Civil Engineering, Michigan State College.

May 16-20 American Materials Handling Society and Materials Handling Show

Sixth National Materials Handling Exposition, International Amphitheatre, Chicago, Ill. Kenneth E. Knowles, Clapp & Polink, Inc., 341 Madison Ave., New York 17, N. Y.

May 31-June 1 National Rivers and Harbors Congress

Forty-second Convention, Mayflower Hotel, Washington, D. C. William H. Webb, executive vice president, NRHC, 1720 M St. N. W., Washington, D. C.

June 2-4 National Society of Professional Engineers

Annual Meeting, Bellevue-Stratford Hotel, Philadelphia, Pa. Kenneth E. Trombley, NSPE, 1121 15th St. N. W., Washington 5, D. C.

June 7-10 American Welding Society

Third Annual Welding Show concurrent with Annual Spring Technical Meeting, Municipal Auditorium, Kansas City, Mo. Joseph G. Magrath, national secretary, AWS, 29 W. 39th St., New York, N. Y.

June 13-18 American Society of Civil Engineers

Convention, Jefferson Hotel, St. Louis, Mo. Brice R. Smith, general chairman, Sverdrup & Parcel, Inc., 1118 Syndicate St., St. Louis, Mo.

June 19-July 2 Material Handling Training Conference

Second Annual Conference, Lake Placid Club, Lake Placid, N. Y. James L. Bright, director, MHTC, 56 Robbins Road, Lexington, Mass.

June 20-22 School for Highway Superintendents

Annual Session, Cornell University, Ithaca, N. Y. J. W. Spencer, highway research and extension engineer, Department of Agricultural Engineering, Cornell University.

June 26-July 1 American Society for Testing Materials

Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. John S. Pettibone, assistant technical secretary, ASTM, 1916 Race St., Philadelphia, Pa.

June 27-29 American Society of Landscape Architects

Fifty-sixth Annual Meeting, Sheraton-Cadillac Hotel, Detroit, Mich. John I. Rogers, general chairman, ASLA, 906 Durant St., Lansing, Mich.

Ebasco Appoints Three

Three new appointments have been made within the engineering, construction, and business consulting firm of Ebasco Services, Inc., New York, N. Y. All three appointments are in the engineering field.

A. T. Larned has been named consulting civil engineer, and C. C. Bonin has been assigned to the post of chief civil engineer. A. C. Clogher will assist Mr. Larned as associate consulting engineer.

The three appointees are graduates of Worcester Polytechnic Institute and have been associated with the firm for many years.

Laudt Is Sales Engineer For Aluminum Industries

As the new sales engineer for the Permite Concrete-Curing Compound Division of Aluminum Industries, Inc., Cincinnati, Ohio, Erwin C. Laudt will be in charge of contacting distributors and contractors east of the Rocky Mountains under the company's sales and service program.

A graduate of the University of Cincinnati with a degree in mechanical engineering, Mr. Laudt was with Liquid Carbonic Corp. and General Electric Corp. before he joined Aluminum Industries, Inc.

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PIERS

SPECIAL DRILLING PROBLEMS

Wire or phone for a quotation on your next foundation job — ANYWHERE IN THE WORLD

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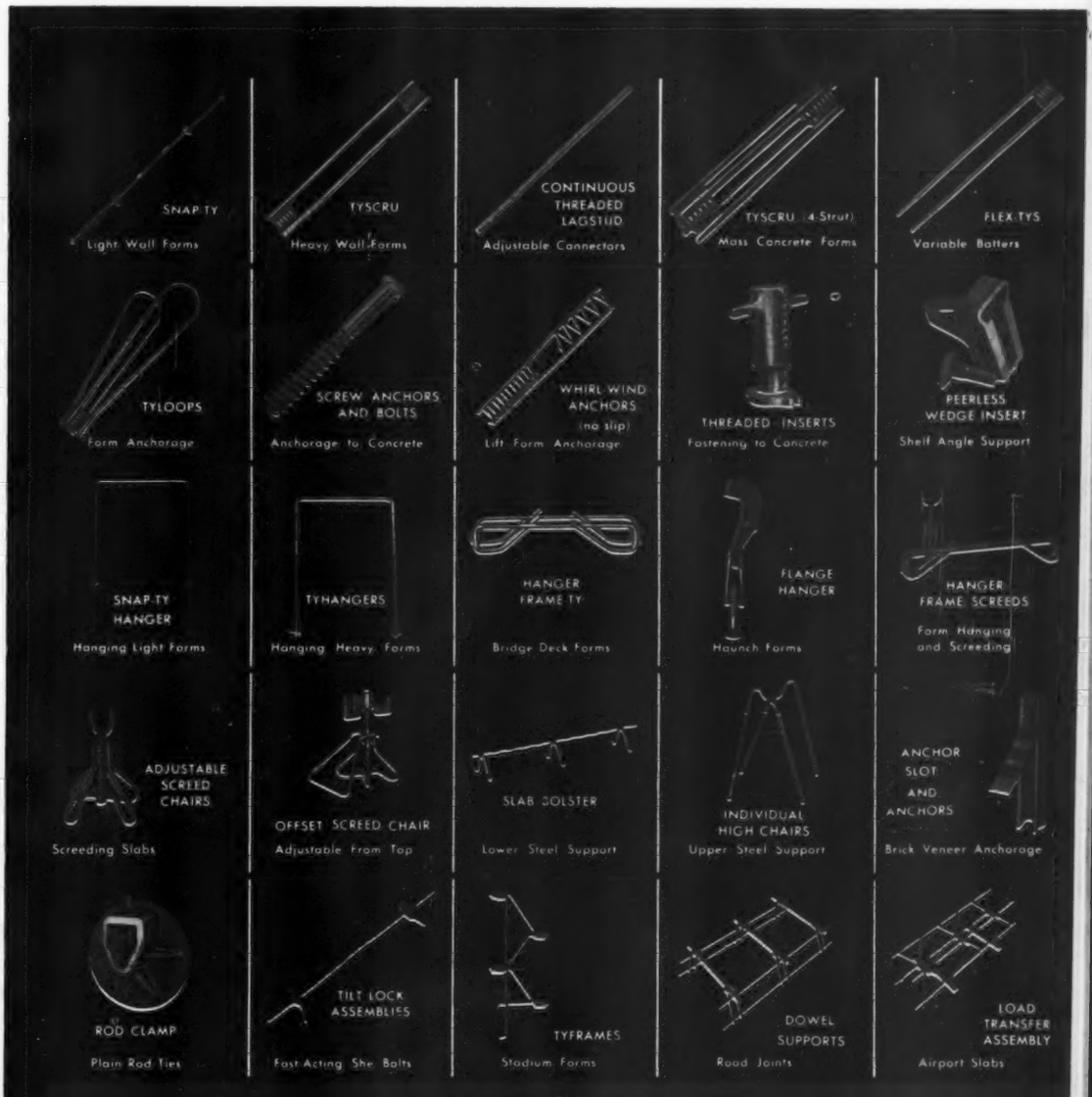

Every Minute of Every Day . . . a Richmond Product is Saving Time and Money . . . on Every Kind of Concrete Construction.

Illustrated are 25 of the products perfected by RICHMOND, pioneer in the concrete construction industry.

This is only a "drop" in the RICHMOND bucket! Our complete line is the largest in the field.

All, have one purpose: to help you do your job with greater speed, safety and savings!

INSIST ON RICHMOND ... AND BE SURE IT'S RICHMOND!

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For our complete catalog see SWEET'S Industrial Construction File 24Ri Architectural File 2ARi

MEMBER Producers Council Association of General Contractors Associated Equipment Distributors Reinforcing Steel Institute

CONSTRUCTION CAMERA

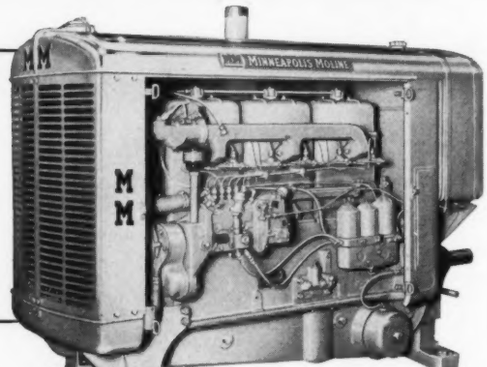
Cleanup work and sloping on the Bradbury and Maddock Debris Basins near Duarte, Calif., is handled by a Lorain Moto-Crane with 40-foot boom and McCaffrey ¾-yard dragline bucket. The basins, a project of the Los Angeles County Flood Control District, catch dirt and debris washed into the area by flash floods.

Solid rock, 20 feet deep in some places, is drilled and blasted by Marsolino Construction Co., Uniontown, Pa., as it works on part of the Pennsylvania Turnpike Extension near Norristown. Ingersoll-Rand Gyro-Flo compressors powered by General Motors diesels supply air for drills working a 6,000-foot-long rock section.

WHY IT PAYS TO OWN INDUSTRIAL DIESELS WITH REMOVABLE CYLINDER BLOCKS AND HEADS

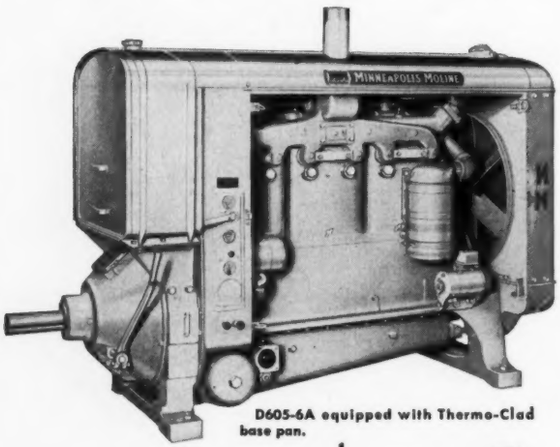
New MM diesels were developed with *energy-cells* to make them last longer, do more and go farther with less down-time and maintenance.

To provide owners with lower cost maintenance when necessary MM diesels are the most advanced and soundly engineered because the cylinder blocks are cast in pairs separate from the crankcase.



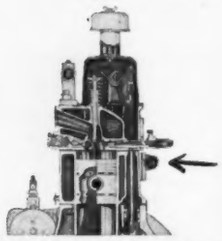
New D605-6A Energy-Cell Diesels last longer because of controlled combustion, patented exclusive fuel filter with gravity and by-pass features, self-cleaning pintle type nozzle, directed cooling of area around combustion chambers.

YOU GET THESE ADDED ADVANTAGES . . .

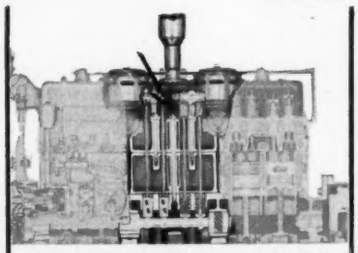


D605-6A equipped with Thermo-Clad base pan.

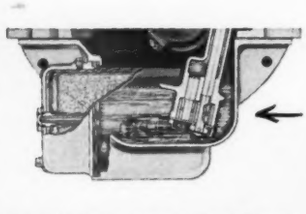
1. Ease of maintenance and low cost emergency service because paired cylinder blocks, pistons, and rods can be removed as a unit by one man.
2. Prolonged time between overhauls by use of close-grain cast iron that provides best cylinder lubrication for reduced wear.
3. Less service due to minimum distortion as MM cylinder heads, cylinder blocks and crankcase are virtually strapped together by full-length steel studs anchored in the main bearing bulkheads. (Transmits combustion pressure to heavy crankcase that has extra depth below center line of crankshaft.)
4. Efficient operation obtained by uniform cylinder expansion . . . the result of controlled cooling and long oil-cooled cylinder wall skirts below ring travel area.
5. "New engine" performance at extremely nominal cost can be obtained right in the field without special tools using factory matched cylinder blocks, pistons, pins, and rings. (Blocks are dowelled to crankcase to assure bore is square with crankshaft and pistons are precision fit to bore . . . equivalent to a factory job.)
6. Lower initial cost stems from high production parts by casting cylinder blocks in pairs separate from the crankcase.



1. Cylinder head and block assembly shows coolant entrance at hottest point first and extra long skirt wall construction.



2. Close-up of how MM cylinder heads and blocks and crankcase are tied into a single rigid unit with long studs.



3. A D283 feature is extra large oil filter enclosed in base pan, floating-screen oil pump intake, and pump located in bottom of base pan.

Optional Thermo-clad water-blanketed base pans for all units also have oil filter included to give more effective filtering.

INDUSTRIAL MINNEAPOLIS-MOLINE MM MODERN MACHINERY DIVISION

MINNEAPOLIS-MOLINE

MINNEAPOLIS 1, MINNESOTA

F. J. Cordova Manages Testing Service Firm

Francisco J. Cordova, a registered professional engineer and geologist, is general manager of Testing Service Corp., South Bend, Ind., a newly organized testing laboratory. The firm, located at 710 N. Brookfield Street, specializes in foundation investigations, soil mechanics, engineering geology, testing of building materials, and the investigation and evaluation of construction materials. It engages in both laboratory and field control and inspection of large engineering projects such as turnpikes, airports, and dams.

A specialist in foundation engineering and engineering geology of the Great Lakes region, Mr. Cordova has served as a consulting engineer on a number of projects in both this country and South America. He has worked with the Tennessee Valley Authority, the U. S. Army Corps of Engineers, and the Inter-American Construction Corp., Buenos Aires.

Mr. Cordova is a member of the American Society for Testing Materials, American Concrete Institute, The Geological Society of America, and the National Society of Professional Engineers.

Booklet Evaluates Costs Of Job and Equipment

A booklet published for public officials, explaining the importance of the over-all cost of a job or equipment and why a low bid may be the most economical one in the long run, is available from Caterpillar Tractor Co., Peoria, Ill. Titled "Look at the Last Cost First", the 12-page booklet may be had from any Caterpillar distributor or by writing the company for booklet D503.

Use the ...

PORTABLE SHELDON PUMP

"You See When Tank Is Full"

★ Pumps 15 gallons per minute
★ Primes itself
★ Lifts Gasoline 15 feet
★ LONG LIFE (No Leathers)
★ Strains Fuel through Replaceable Strainer

SHELDON TRACTOR FILLER CO.

CUNNINGHAM - - KANSAS

Foundations completed for the Carrollton Apartments in Baltimore, Md., an International Drott TD-9 Skid-Shovel backfills around the footings. The $2 million air-conditioned structure, which will have an 80-car underground garage, is being built by Mullan Contracting Co., Baltimore.

Excavating wet clay is routine work for a Manitowoc 2000 dragline working on the roadbed for the Maine Turnpike extension near Gray, Maine. A clear pattern of teeth marks is left in the sticky material. Savin Construction Co., East Hartford, Conn., uses Euclids to haul the material away.

Company's Operations Described in Brochure

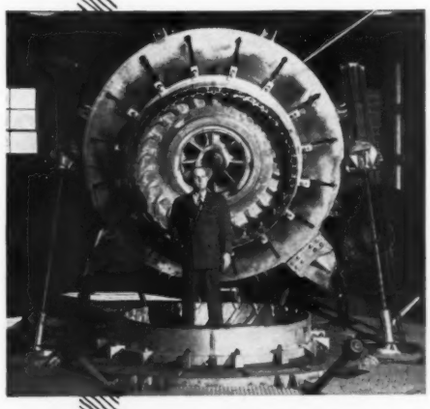
A brochure telling the history and describing the operations of Construction Aggregates Corp., Chicago, Ill., is available from the company. Titled "Men, Methods, & Machinery", the booklet contains histories of actual jobs performed by CAC in which the Sensibar sandfill method was used to restore beaches. The company's work on ports in both this country and abroad, its use of the Sensibar method in the construction of the New Jersey Turnpike, and its operations in the construction of a number of plants are described and illustrated with on-the-job photographs.

The reports contained in the brochure outline the scope of the company's operations and services and illustrate the ability of the firm to come up with unique solutions to special construction problems. The booklet may be had without charge by writing to Construction Aggregates Corp., Dept. CON, 33 N. LaSalle St., Chicago 2, Ill.

Schilling Remains Head Of NYC Cement League

Fred E. Schilling, vice president of Turner Construction Co., New York, N. Y., has been reelected president of the Cement League of New York City, an association of contractors specializing in concrete construction.

Also elected at the annual meeting of the organization were William Joshua Barney, Jr., vice president; James Pottinger, treasurer; and George N. Cohen, secretary. The three men are associated, respectively, with the W. J. Barney Corp., J. Pottinger Co., and Euclid Contracting Corp., all located in New York City.



THE GENERAL TIRE WITH NEW NYGEN CORD

Only plant in the South equipped to retread tires up through 2700-33. Retreads like new tires at 50% savings.

General's new NYGEN CORD tire has built-in strength. Pound for pound, NYGEN CORD is stronger than steel cables!

Specialists in BIG TIRE SERVICE

WITHIN 1200 MILES OF CORPUS CHRISTI

You save money when you turn your BIG TIRE troubles over to a BIG TIRE specialist. Specially designed field trucks with power tools, giant hoists and built-in light plants will keep your heavy equipment rolling. Save costly "downtime" by depending on Dickenson to get the job done right and quickly the first time.

CHECK THESE EXTRA FREE ON THE JOB SERVICES

- Complete field service with special equipment
- Fast pickup and delivery within 1200 mile radius
- Periodic inspection on-the-job
- Mount tires
- Rotate tires when necessary
- Furnish "loaners" while doing your retreading.

Dickenson dependable service is backed by 25 years experience. Let us show you how our plan can help you at no obligation to you.

WRITE • WIRE • CALL TODAY — COLLECT

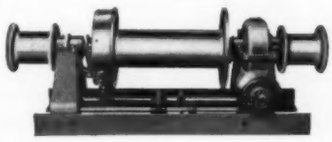
DICKENSON GENERAL TIRE SERVICE

323 N. Water Street • Phone 4-7773 • Corpus Christi, Texas

Why Break your Back?

USE TULSA* WINCH

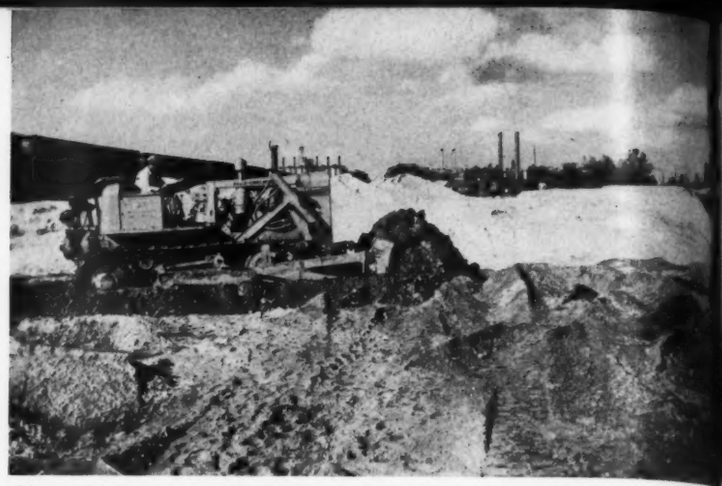
Drillers, helpers and pushers all agree that Tulsa Winch makes work around the rigs easier, safer and quicker. Whether they are skidding a 500 ton rig or moving a drill bit, Tulsa Winch can handle the job. 28 models for all makes and models of trucks and crawler tractors.



Tulsa* Winch
TULSA, OKLAHOMA DIVISION OF VICKERS Inc.

*Reg. U. S. Pat. Off.

Made-to-order weather with heating units and 21,000 square feet of Flamazel fireproofed tarpaulins on Patent scaffolding enables remodeling of the headquarters of the Lions International in Chicago, Ill., to be done in below-zero temperatures. C. W. Haynes Co., Chicago, is the contractor on the $800,000 project.



Fill material for a new roadbed for Pennsylvania Railroad tracks in South Philadelphia is stockpiled as it is dredged from the Delaware River. James Armour, Inc., Philadelphia, uses an Allis-Chalmers HD-15 with Gar Wood hydraulic dozer on the job.

In TROPICAL JUNGLES, too, GYRO-FLO means dependable air power

GYRO-FLO 315 cfm portable compressor on location near Laguna de Güija dam site, El Salvador. In this remote and isolated spot, GYRO-FLO's exceptional freedom from maintenance has been an important advantage.

A JHM Wagon Drill and three J-50 Jackdrills form the "business end" of this I-R Contractors' Combination—averaging 1200 feet per bit with Series 115 Carsets in hard abrasive basalt.

HERE, in the tropical jungle of Central America, an I-R Contractors' Combination is helping to dam the outlet of Lake Güija. Consisting of a 315 cfm GYRO-FLO portable compressor, JHM wagon drill and three J-50 Jackhamers, this combination is being used by Padilla-Cuéllar, contractors, for removal of 100,000 cubic meters of rock and the building of a 12 meter by 60 meter dam—part of a large hydro-electric project under the Comisión Ejercitiva del Río Lempa.

Drilling in hard abrasive basalt, with Series 115 Carset Jackbits, they have averaged 1200 feet per bit. And the 315 cfm GYRO-FLO rotary compressor has lived up to its reputation for smooth, trouble-free performance. On a job like this, where major service facilities are far away, *dependability* is a mighty big asset!

Plan now to take advantage of a GYRO-FLO on *your* next construction job. They're available in 125, 210, 315 and 600 cfm sizes. Ask your I-R representative for complete details.

I-R CONTRACTORS' COMBINATION

Ingersoll-Rand

11 Broadway, New York 4, N.Y., U.S.A. 2-78

Styles illustrated
50-00 Jacket
51-05 Pants
53-15 Hat

Protective Clothing by Sawyer

Wears like iron — takes endless rubbing, scraping, snagging, and still gives full protection.

100% Waterproof — made with top quality base fabric saturation-coated first and then coated with 6 coats of Neoprene Latex.

Positively will not blister, crack or peel. Its longer lasting quality means greater economy.

Also: Three-quarter and long coats, aprons, coveralls and many other styles. All clothing made in black or yellow.

FROG BRAND
THE H.M. SAWYER & SON CO.
Cambridge, Massachusetts

By-passing a road around a community—a growing trend in highway construction—is done here just outside Brighton, Colo., where a Bucyrus-Erie 38-B dragline works on the project. The improvement is being handled by Northwest Engineering Co., Denver, Colo.

A full load of borrow-pit material is hauled by a Caterpillar No. 70 scraper and D7 tractor to one of the highest earth-fill dams built in Nevada, while a Cat D6 tractor and scraper, background, pick up another load. The dam, on the Adler Creek Ranch in Humboldt County, will provide a reservoir for irrigation.

Fundamental Facts On Wellpoint Dewatering

■ A handbook on the fundamentals of wellpoint dewatering is available from Griffin Wellpoint Corp., 881 East 141st St., New York 54, N. Y. Applying to any wellpoint system, the handbook contains information on how a wellpoint system functions, and methods of planning, layout, installation, and removal of the system.

Engineers and contractors can obtain this 109-page book free if their requests are written on letterhead stationery. The cost to others is $1.50.

The company also offers a catalog presenting the various items of Griffin wellpoint equipment. This brochure contains a series of actual job photos showing the equipment on different types of construction projects and analyzing the specific problems encountered on each job.

Also available on request is a booklet describing Griffin jetting equipment for pile and caisson jetting, pipeline testing, and water supply and fire protection.

To obtain the latter two booklets write to the company, or use the Request Card at page 18. Circle No. 689.

Texas Builds Soil-Cement Widening—2 Miles a Day*

P&H Soil Stabilizer Processes 9,000 Sq. Yd. Daily With Perfect Control of Quality

Close-up of P&H Model LA-88 Single Pass Stabilizer processing soil-cement.

Texas State Highway 79, originally built in 1928-29, was recently modernized in record time for today's traffic needs.

State Highway Officials decided the old 18-ft. pavement should be widened to 24 ft., for a total of 17 miles. Low-cost and maximum use of local materials were musts. Low bidder among nine contractors was Austin Asphalt Company, Dallas.

P&H Stabilizer Key to High Production

With the old shoulder soil removed to a 14-in. depth and an 8-ft. width on one side, 30 cu. yd. per station of crushed sandstone were dumped on

Behind the Stabilizer, two sheep's-foot rollers compacted the mixture.

the concrete pavement at regular intervals. This was bladed into the trench, watered and rolled for an 8-in. sub-base. Over this, 20 cu. yd. per station of crushed sandstone were placed to a 7-ft. width. Cement, for an 8% cement factor, was then spread, working no more than 1,000 ft. ahead of the P&H Soil Stabilizer as a guard against cement loss. Actually, this distance ahead was rarely reached, though, because of the high mixing speed which the Stabilizer maintained.

A More Stable, More Durable Base

Behind the cement spreader, the P&H Stabilizer pulverized the partially compacted sandstone, dry mixed it with cement, added the proper amount of water and deposited a uniform layer of soil-cement ready for immediate compaction.

Here curing seal is applied at the rate of 0.2 gallon per sq. yd.

Then, after curing, a 250 lb. hot-mix bituminous surface was placed over the old pavement and widening in two courses to complete modernization of this veteran road. The road was kept open to traffic throughout construction and the widening was opened to traffic as soon as the curing seal was blotted.

For more information on P&H "Single-Pass" Soil Stabilizers, write to C. R. Morgan Jr., P&H Soil Stabilizer Division, Harnischfeger Corporation, Milwaukee 46, Wisconsin.

Side view of P&H Model LA-88 Stabilizer. Only 1 man required to operate.

** The following data is based on a January, 1955 presentation to the American Road Builders' Association Committee on Soil-Cement stabilization by Mr. A. D. January, Wichita Falls, Texas, Senior Resident Engineer of the Texas State Highway Dept.*

HARNISCHFEGER

The last girder on the west approach of the $40 million Newark Bay crossing of the New Jersey Turnpike's Hudson County extension is placed by two 115-ton derricks on a single traveler. Fabrication and erection of steel is handled by Bethlehem Steel Co.

Working on a 45-degree slope, men seal construction joints along the sides of the Johnstown, Pa., concrete channel lining. Presstite No. 77 cold-applied sealing compound was pumped directly from shipping drums. Specifications called for a sealer that would not sag or flow downhill during sealing operations.

Foundation Pipe Piling

■ A new bulletin describes the characteristics of Taylor Forge foundation pipe for piling, and illustrates its application in the construction of bridges and buildings.

Photographs show actual pile-driving operations on two construction projects, and the bulletin presents the pile-driving logs from these jobs.

Sizes of pipe commonly used for piling are listed, and driving ends such as drive sleeves and drive points are shown.

To obtain Bulletin 542 write to Taylor Forge & Pipe Works, P. O. Box 485, Chicago 90, Ill., or use the Request Card at page 18. Circle No. 675.

New Transit Announced

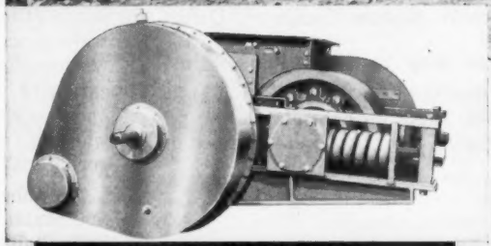
■ A new transit reported to be priced below competitive models has an optical system accurate enough to read ¼ inch at 1,000 feet. The telescope on the Mikron transit plunges 180 degrees and the instrument has internal focusing. Horizontal and vertical verniers offer direct reading to 5 minutes of an arc, and horizontal and vertical circles are graduated every degree.

This transit is recommended by the manufacturer for such uses as checking road and highway routes, determining water boundaries, and leveling floors. The instrument comes complete with hardwood carrying case and strap, plumb bob, magnifying glass, screw driver, adjusting pin, sunshade, and tripod.

For further information write to Mikron Instruments, Inc., 1966 E. Walnut St., Pasadena, Calif., or use the Request Card at page 18. Circle No. 615.

The Mikron transit.

12% MORE FINER-SIZED AGGREGATE AT



HIGHER TONNAGES OF FINE-CRUSHED PRODUCTS

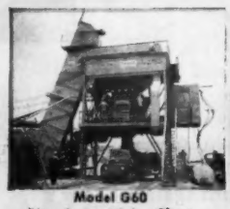
This new 30' x 25' Cedarapids Roll Crusher handles the same size feed as the 30' x 22' formerly used in the Commander, but its higher capacity makes it the best size to balance the great screening capacity of the Commander's big screen. This design ratio of crushers, screen and conveyors is the secret of the Commander's big-volume production at low cost per ton.

MORE REASONS WHY YOU'LL "Command the Market" WITH A CEDARAPIDS COMMANDER

- Large 48" x 10' Horizontal Vibrating Screen gives the extra screening capacity necessary to balance the greater output of the new 30" x 25" Roll Crusher, and assures maximum screening efficiency.
- 30" wide conveyors throughout the plant easily handle the increased capacity.
- Engineered for *minimum maintenance* with sealed bearings on all return rolls and troughing rolls, self-aligning bearings, disc clutches, sealed crusher bearings, stress-relieved crusher bases and screen box, free use of alloy steel, easy access for lubrication and service adjustments.

GET COMPLETE DETAILS FROM YOUR CEDARAPIDS DISTRIBUTOR

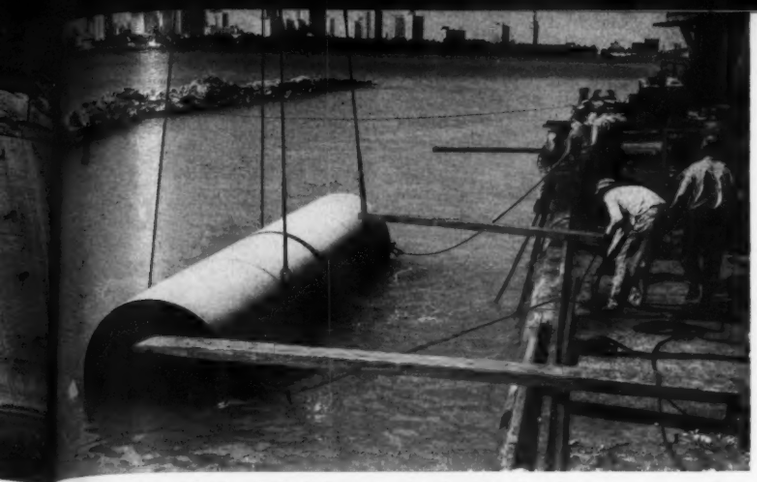
ASK ABOUT THESE CEDARAPIDS PLANTS


Model G60 Bituminous Mixing Plant

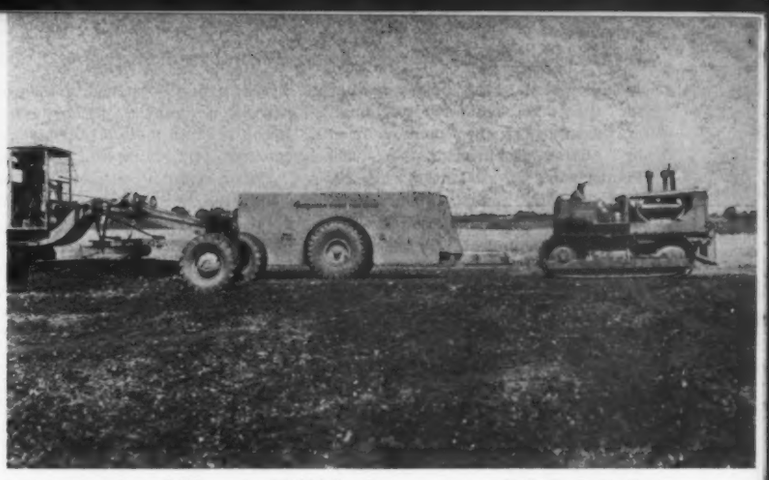
Model CM Bituminous Mixing Plant

Single Pass Crushing and Screening Plant

Double Impeller Impact Breaker



A section of 32-foot 72-inch-diameter pipe for Miami's subaqueous sewage force main under Biscayne Bay is lowered into place by a Merritt-Chapman & Scott derrick boat. Pipe sections for the $27 million sewage-treatment facility weigh 32 tons and were cast by Price Bros., Dayton, Ohio, at nearby Coral Gables.



Good compaction of fill on the 10,000-foot-long runway at Little Rock Air Force Base, Little Rock, Ark., is provided by a Ferguson 50-ton rubber-tire roller pulled by an Allis-Chalmers HD-20 tractor. An Adams 610 motor grader works close to the compacting unit on the 3,350,000 cubic yard earthmoving job.

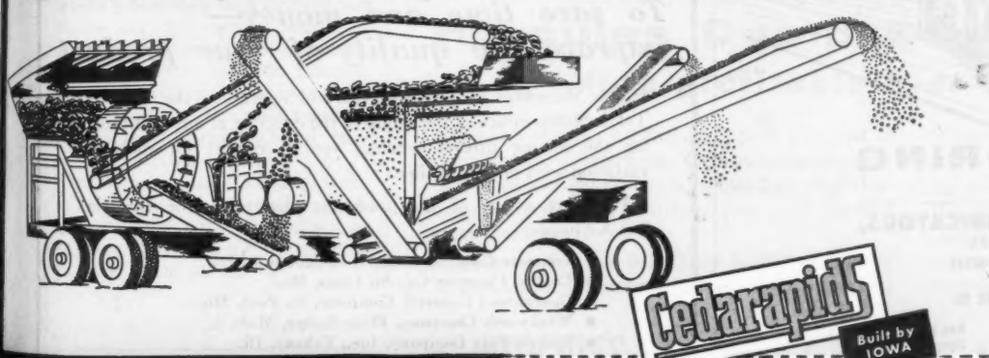
TE AT THE SAME COST PER TON!

ANNOUNCING BIG NEW 30"x25" ROLL CRUSHER!

Increases CEDARAPIDS COMMANDER secondary crushing capacity by 12%

Here's the best answer to *greatly increased* output of finer sizes, or more profitable operation in pits with high percentages of fines. Now Cedarapids Commander production is *even greater* than the enormous tonnages turned out by the plant originally equipped with a 30" x 22" roll crusher. The roll crusher is the final sizing or metering point—12% more roll crusher capacity also means the jaw crusher can be opened larger for additional extra capacity, depending upon crusher feed size, *without increasing operating or maintenance costs one cent!*

Bigger roll crusher—large screen—wide conveyors . . . ALL BALANCED FOR MAXIMUM PRODUCTION



IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

IOWA MANUFACTURING COMPANY, Cedar Rapids, Iowa, U. S. A.
Gentlemen: Please send further information about:
☐ Commander Plants
☐ New 30" x 25" Roll Crushers
☐ Other Cedarapids Aggregate Plants
☐ Bituminous Mixing Plants

Name_____
Company_____
Address_____
City_____ Zone____ State____

Sand and Gravel Body Re-elects John Murphy

Heading officers of the National Sand & Gravel Association for 1955 is John W. Murphy of the Union Sand & Gravel Co., Spokane, Wash., president. He was re-elected at the 39th annual convention at Miami, Fla.

Also re-elected were Roy E. Weaver of the Lincoln Sand & Gravel Co., Lincoln, Ill., vice president, and E. Phil Gemmer of the Texas Construction Material Co., Houston, Texas, secretary-treasurer.

Named to the executive committee were Harold E. Bender, Azusa Rock & Sand Co., Azusa, Calif.; J. Paul Calhoun, Consolidated Gravel Co., Inc., Columbus, Ga.; E. K. Davison, J. K. Davison & Bro., Pittsburgh, Pa.; and Howard W. Jordan, Metropolitan Sand & Gravel Corp., Port Washington, N. Y.

Hydraulic Gear Pump For Highway Machinery

■ A new gear-type oil hydraulic pump has been placed on the market by Commercial Shearing & Stamping Co., Youngstown 1, Ohio. Recommended for use on construction machinery, the H series pump is reported to provide a power source that maintains a high constant delivery at high-pressure operation. This pump is recommended by the manufacturer for continuous-duty operation at pressure as high as 2,000 psi.

The pump is available in a range of sizes giving a discharge volume of 12 to 42 gpm at 1,200 rpm. Several pumps can be mounted in tandem on one common shaft for direct connection to one power source.

For further information write to the company, or use the Request Card at page 18. Circle No. 662.

This new hydraulic gear pump maintains constant high pressure.

Impact Crusher Reduces Small Gravel and Stone

■ A centrifugal-type impact crusher for the finer reduction of small gravels and stone has been announced by Adams Engineering Co., 500 Pennsylvania Ave., Matamoras, Pa. The Tornado impact crusher produces fine and intermediate sizes of highly cubical material. It features a vertical impeller that hurls material squarely against specially-designed impact plates. According to the manufacturer, there is no attritional grinding, and efficiency is maintained until the impeller shoes are worn out.

The Tornado is not recommended for the reduction of highly abrasive materials where the use of the gyratory type of fine reduction crusher is warranted. Offered at a relatively low initial cost, the machine is recommended for the small producer who desires a highly cubical small product with a minimum of extreme fines. It can produce material for blacktop, concrete, and all highway surfacing.

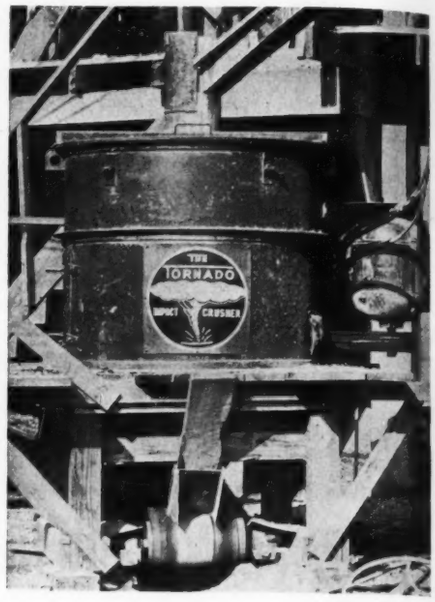
The machine is reported to be particularly effective on round gravels because it hits every piece regardless of size or shape. This increases the percentage of crushed particles while reducing flats, slivers, and soft stone.

The 4½-foot Tornado crusher will take material from 2 inches and down in size. The machine will handle up to 60 tons per hour using a 10 to 40-hp power source. It has a 5 to 7-inch circular feed pipe and operates at from 1,200 to 1,600 rpm with velocities up to 12,000 feet per minute.

A feature of the crusher is the accessibility of parts for replacement. The impeller shoes tap off with a hammer and replacements may be hooked on. The five breaker plates are secured by only one wedge. The only moving part is the spindle, which is journaled by spherical roller bearings.

The Tornado crusher may be installed quickly on steel or timber supports, and does not require heavy concrete foundations.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 749.

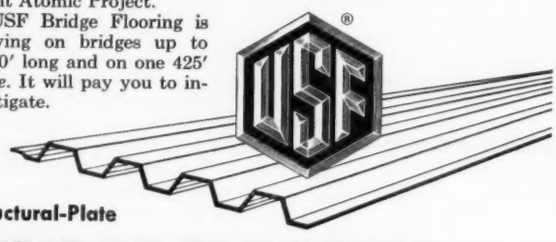


◄ The Tornado impact crusher produces highly cubical materials and handles small gravel and stone.

This 1000-foot bridge now stays open to traffic

The picture has changed. It frequently read "Closed to Traffic" while maintenance crews worked to patch up worn plank flooring. Then over a year ago U.S.F. Structural Plate Bridge Flooring and a bituminous surface was installed. Since that time the bridge has been in constant use, and still looks and serves like new despite heavy traffic from a nearby giant Atomic Project.

USF Bridge Flooring is serving on bridges up to 1000′ long and on one 425′ *wide*. It will pay you to investigate.



Structural-Plate
BRIDGE FLOORING

Write **UNITED STEEL FABRICATORS,**
INCORPORATED
WOOSTER, OHIO

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Attention Central-Mix Operators

IMPERIAL TEL-A-SLUMP

Now Available in TWO MODELS

*Indicating
*Recording & Indicating

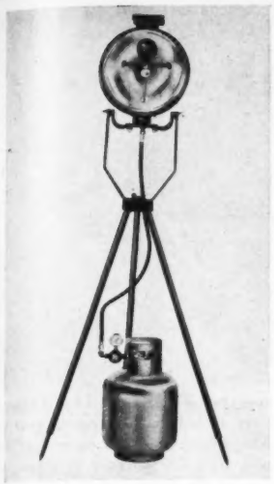
To save time and money— improve the quality of your product

Highly successful in over five years of operation, the Imperial Tel-A-Slump indicates the slump of the concrete at any point during the mixing process—enables you to correct for moisture variation with no loss of time.

Here are a few of the producers now using the Imperial Tel-A-Slump:

- Concrete Corp. of Indiana, Indianapolis, Ind.
- Central Concrete Co., St. Louis, Mo.
- Guaranteed Concrete Company, St. Paul, Minn.
- Winkworth Company, River Rouge, Mich.
- Somers-Barr Company, Inc., Urbana, Ill.
- Tews Lime & Cement Co., Milwaukee, Wis.
- State Washed Sand & Gravel Co., Milwaukee, Wis.
- Corning & Donahue, St. Paul, Minn.
- Economy Coal & Building Materials, Waukegan, Ill.
- C. G. DeBolt Concrete Co., Richmond, Ind.
- Erie Ready-Mix Concrete Co., Erie, Pa.

IMPERIAL CONSTRUCTION EQUIPMENT COMPANY
Division of Imperial Flooring and Waterproofing Company
230 W. NORTH AVENUE NORTHLAKE CITY, ILLINOIS
TRUCK MIXERS • BLOCK UNLOADERS • PLANT CONTROLS



The Tilley Model BL-64 gas-burning floodlight is shown mounted on a telescopic tripod. It may also be obtained to mount on a tank bracket or with a short stand.

New Floodlight Burns Propane or Butane

■ A new propane or butane-burning Tilley floodlight burns 45 to 50 hours on a 20-pound tank of gas. The floodlight produces a white light with a maximum intensity of 6,000 candle power, and has a regulator for increasing or decreasing the light as desired. Operating pressure may be controlled from ½ to 15 pounds.

The Model BL-64 can be instantly lighted with a match. It is protected against weather damage and will operate in temperatures down to 45 degrees below zero. The light throws a beam approximately 150 × 75 feet.

For further information write to Wm. W. Lee & Son, 20 E. Jackson Blvd., Chicago 4, Ill., or use the Request Card that is bound in at page 18. Circle No. 676.

Catalog on Engine

■ A new bulletin describes and illustrates the 115 to 410-hp Le Roi L3000, H2000, and F1500 engines, The booklet uses cutaway views and photographs to show such features as the advanced valve-in-head design of the engines.

Also covered are the engines' full-length guided valve stem mechanisms, lightweight cam-ground aluminum pistons, drop-forged crankshafts with polished bearing surfaces, full-flow oil filters, sectional water-cooled exhaust manifolds, large main bearings, full-pressure lubrication, and conveniently located controls.

To obtain Catalog No. E-9, write to Le Roi Division, Westinghouse Air Brake Co., 1706 S. 68th St., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 663.

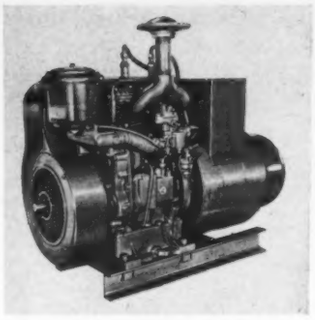
Tunnel Liner Plates

■ Describing the advantages of Armco liner plates in tunneling, a new folder also discusses their use in sewers, conduits, service tunnels, underpasses, shafts, caissons, and aggregate-conveyor tunnels.

Underground structures formed from Armco liner plates are normally used for permanent installations and may be round, elliptical, or of almost any curvature of arch.

Supplied for structures having diameters of 4 feet and larger in 2-inch increments, the liner plates are available in material thicknesses of 3 through 14 gage.

To obtain this literature write to Armco Steel Corp., 703 Curtis St., Middletown, Ohio, or use the Request Card that is bound in at page 18. Circle No. 696.



The Series 102 Universal electric plants, just announced, features lightweight and simplified operation.

Improved Electric Plants

■ Production of a new series of 5,500-watt ac electric plants is announced by Universal Motor Co., 532 Universal Drive, Oshkosh, Wis. The Series 102 features plants that are extremely small for their capacity. They measure only 37 inches over-all and 29 inches in height, and weight under 500 pounds.

Major changes reported by the manufacturer are the use of a more efficient generator and simplified controls. The 2-cylinder four-cycle air-cooled gasoline engine used as a power source is reported to have a low fuel consumption.

Models are available with manual control, electric starting, or remote control.

For further information write to the company, or use the Request Card at page 18. Circle No. 672.

Hercules Dump Bodies and Hoists

More profitable over the long haul!

When you consider original investment plus cost of operation and maintenance, Hercules equipment handles more tons per dollar. It follows then, that Hercules equipment can help keep your costs low and make you more profit!

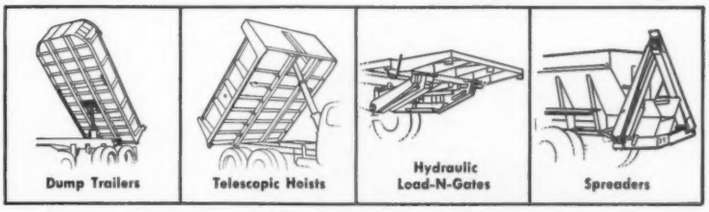
Hercules makes 'em all—Dump Bodies and Hoists . . . pick-up size to tandem-tandem dump trailer giants!

Whatever your job . . . Hercules builds it to fit your job . . . to do your job better.

Get in touch with your truck dealer or your nearby Hercules Truck Equipment Distributor. Meanwhile send for the new Hercules Full-line Folder, your guide to satisfaction and profit . . . in truck and contractor's equipment.

HERCULES 1905 1955 50th ANNIVERSARY

Buy from the line of strongest design



HERCULES STEEL PRODUCTS CORPORATION • GALION, OHIO

Unisteel Body Co., a Division of HERCULES, producers of Standard and Custom Van Truck Bodies

5501

DRILLING CONTRACTORS

Diamond and Shot Core Borings, Dry Sample Borings, Grout Holes and Pressure Grouting, Foundation Testing for Bridges, Dams and all Heavy Structures

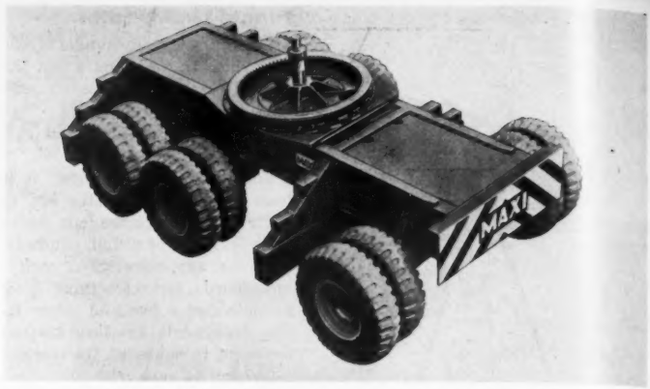
Leading manufacturers, also, of High-Speed Diamond Drilling Machines and Complete Accessory Equipment, Including all types of Diamond Drilling Bits.

Write for Catalog No. 320

SPRAGUE & HENWOOD, INC.

Dept. C, Scranton 2, Pa.

Michigan excavator cranes feature a simple air-control system that delivers air pressure directly from the control valves to the clutch rams. Advantages of the air system are that it eliminates the maintenance and daily lubrication that mechanical linkages require. For details circle 748 on card at page 18, or write to Clark Equipment Co., Construction Machinery Division, Benton Harbor, Mich.



The new Maxi Model 6440 self-propelled crane carrier is designed for cranes having up to a 45-ton capacity. Special features include a heavy-duty two-speed transmission, deep section frame, new walking-beam-type rear axles, oscillating front axle, and hydraulic steering. For details circle 747 on card at page 18, or write to Maxi Corp., 1584 E. 20th St., Los Angeles 54, Calif.

paved by
Schultz & Lindsay with this BLAW-KNOX "Complete Package"

The Blaw-Knox "Complete Paving Package" used by Schultz & Lindsay

● Cement Batching Plant ● Aggregate Batching Plant ● Precision Subgrader ● Self-Aligning Steel Paving Forms for Roads and Airports ● Steel Forms for Curb, Curb and Gutter, Integral Curb, and Median Dividers ● Concrete Spreader with Vibrating Attachment (also available with screed attachment) ● Concrete Finishing Machine

For your job, you can add

● Clamshell Buckets ● Concrete Buckets ● Base Course Pavers ● Road Wideners and Trench Rollers ● A "Complete Package" of ready-mix equipment, including Hi-Boy Trukmixers and one-stop Truck Mixer Loading Plants

See your BLAW-KNOX distributor about "Complete Package" advantages

North Dakota started the ball rolling toward faster travel between Grand Forks and Winnipeg by awarding Schultz & Lindsay Construction Company the contract to pave 11.4 miles of State Highway 44. And the Fargo contractor kept the job rolling by using a Blaw-Knox "Complete Package" of paving equipment to step up the paving operation to a profitable, schedule trimming pace.

Wherever there's a big paving project . . . super-highway, toll road, expressway . . . or airport runway . . . you'll probably find a balanced team of Blaw-Knox units speeding the job. More and more contractors all over the country are taking advantage of the one-source, one-responsibility economies of Blaw-Knox "Complete Package" paving methods.

BLAW-KNOX

BLAW-KNOX COMPANY
CONSTRUCTION EQUIPMENT DIVISION, Pittsburgh 38, Pa.
Offices in Principal Cities

Blaw-Knox Aggregate Batching Plant used on "short-cut to Winnipeg".

Schultz & Lindsay's Multi-Foote 34E DuoMix Paver.

A loaded batch truck on the ramp over Schultz & Lindsay's Blaw-Knox Precision Subgrader, on the way to the paver.

Blaw-Knox Cement Batching Plant on the North Dakota State Highway job.

Operating Tips Included In Shovel-Crane Booklet

A manual for operators of power cranes, shovels, draglines, clamshells, and hoes, called "125 Ways to Better Power Shovel-Crane Operation", has been published by the Power Crane & Shovel Association. The booklet covers such subjects as starting and stopping the machine, working around high lines, and operation of the various types of rigs. Some valuable do's and don'ts are listed.

The manual is available without charge to students in engineering schools and colleges, as well as to members of the International Union of Operating Engineers and their locals. Others may secure copies at 15 cents each from Power Crane & Shovel Association, 74 Trinity Place, New York 6, N. Y.

Angle-Iron Shear

■ A bulletin available on request contains details on the Whitney-Jensen No. 4 angle-iron shear. The literature emphasizes that although the shear weighs only 48 pounds complete with a 72-inch bar handle, it will cut off any mild-steel angle-iron up to $2 \times 2 \times \frac{1}{4}$ inches in size.

Also illustrated are two other angle-iron tools, a bender, and a notcher. The three tools are available mounted on a single stand as a combination unit.

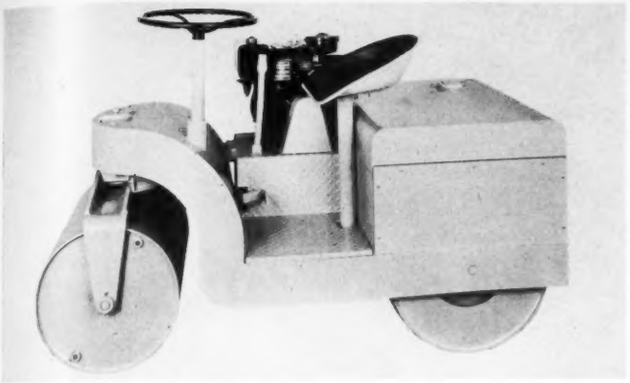
To obtain this literature write to Whitney Metal Tool Co., 724 Forbes St., Rockford, Ill., or use the Request Card at page 18. Circle No. 722.

STANDS UP TO SEVERE USE

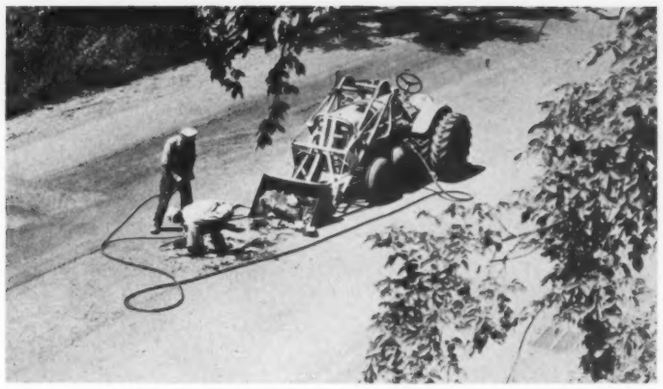
and even abuse

One word describes a Hayward — **ruggedness.** Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church Street, New York 7, N. Y.

HAYWARD BUCKETS
CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES
famous for performance since 1888



Western Duty Deluxe power rollers are offered in 1, 1½, and 2-ton models. Fabricated of heavy steel plate and channels, the rollers have 24 × 32-inch rear rolls that work within ¾-inch of walls or curbs without added attachments. A trailer is available for the rollers. For details circle 746 on card at page 18, or write to Western Welding & Mfg. Corp., 2025 W. Clybourn St., Milwaukee 3, Wis.



The air output of the Le Roi Tractair, a combination compressor and 35-hp wheel tractor, has been increased from 105 to 125 cfm. Also, the engine speed can now be varied to match air demand with a new Econotrol control added. The unit is shown using a breaker and a loader. For details circle 744 on card at page 18, or write to Le Roi Division, Westinghouse Air Brake Co., Milwaukee 14, Wis.

Lightweight Steel Legs for Making Barricades

■ Versatile lightweight steel legs that can be used to make barricades, to mount road flare and lantern holders, and hold batter boards for trench depth grading are shown in literature available on request.

Fabricated from rolled channels and steel bars, the legs have an opening for 2 × 6-inch dressed lumber for making barricade signs. The legs stand 36 inches high and are 28½ inches wide at the base.

Easy to store, 100 pairs of the steel legs occupy only 10 cubic feet.

The literature also shows a road flare and lantern holder that slips over the top of a pair of the steel legs.

To obtain this literature write to Binghamton Metal Forms, Inc., 15-19 Griswold St., Binghamton, N. Y., or use the Request Card at page 18. Circle No. 721.

ASPHALT MIXING PLANTS
2000 TO 6000 LB. CAPACITY

20 years experience in design and manufacture of this truly balanced equipment, assures McCarter customers of standardized parts and minimum costs.

McCarter standard plants — designed and manufactured in their own works are readily adaptable to your special requirements. Individual units also available.

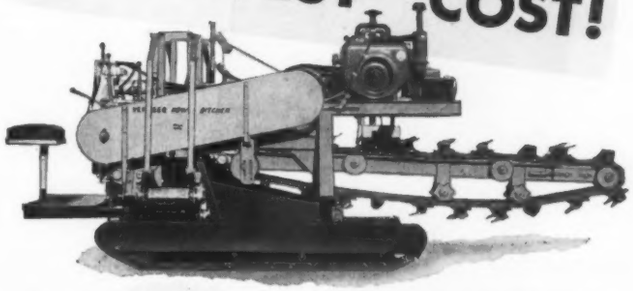
DRYERS (hot or hot & cold material, center outlet type) • MIXERS • ASPHALT BUCKETS (Steam, hot oil or electric heated) • AGGREGATE HOPPERS • BINS • APRON TYPE FEEDERS • CYCLONE COLLECTORS • ELEVATORS • STEEL STRUCTURES

Our Sales Engineers will gladly consult with you!

REPAIRING AND REMODELING OLD PLANTS—A SPECIALTY

Mc McCARTER IRON WORKS, INC. Norristown, Pa.

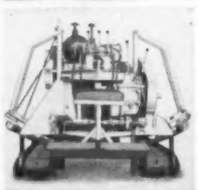
GET BIG DITCHER PERFORMANCE AT LOWEST COST!



IT'S HEAVIER! IT'S STRONGER! IT'S LARGER!

NEW VERMEER MODEL 524T POW-R-DITCHER

Overhead Action View



Front View

DIGS 8", 10", 14", 18" and 24" WIDE and DOWN TO 6 FEET DEEP

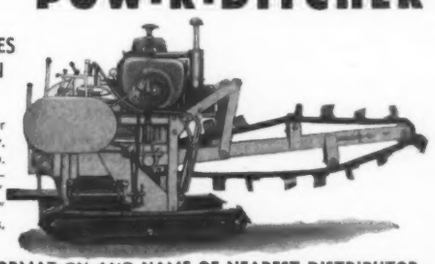
Here's the *new 524T* POW-R-DITCHER . . . it's heavier, stronger, more rugged! Ideal for constractors, municipalities, utility companies, etc. A *low priced ditcher* that does the work of more expensive ditchers and trenchers . . . at a fraction of the cost! 5-speed International Truck Transmission. Hydraulically engaged steering controls. Weighs 5400 lbs. Ruggedly built and designed to handle wide foundation footings, gas, water and sewage lines. Get all the details NOW on the *524T!*

ALSO NEW...

MODEL 4T POW-R-DITCHER

FOR GAS PIPE, CABLE LINES & HOME CONSTRUCTION ONLY 42" WIDE!

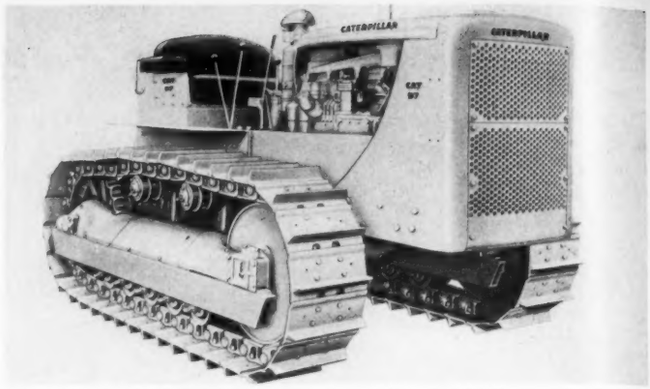
Here's the Vermeer Midget ditcher . . . the **Model 4T Pow-R-Ditcher.** Self propelled by 15 or 25 hp. Wisconsin Engine. Can be transported in a pickup truck. Only 6' high, 13' long. Digs 6" to 14" wide, 4' deep. Weighs 2500 lbs. A real workhorse!



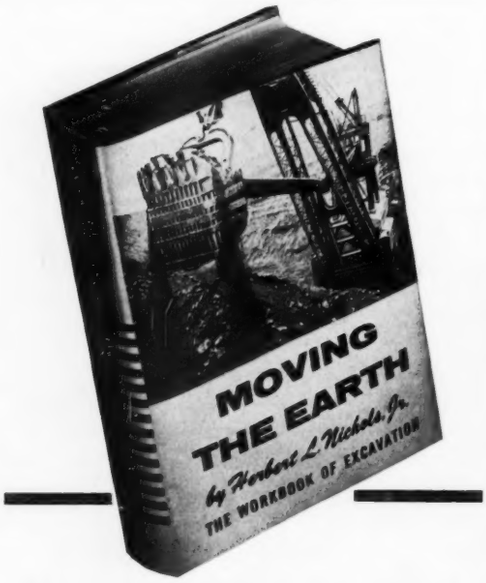
WRITE FOR COMPLETE INFORMATION AND NAME OF NEAREST DISTRIBUTOR

VERMEER MFG. CO., Pella, Iowa

This new Gruendler all-purpose mobile crushing plant is engineered to handle pit and quarry applications with one unit. The plant converts large gravel boulders or jagged quarry rock into three specification materials. A washing device is standard equipment. For details circle 743 on card at page 18, or write to Gruendler Crusher & Pulverizer Co., 2915-17 N. Market St., St. Louis 6, Mo.



The engine in the Caterpillar D7 tractor now delivers 128-horsepower at 1,200 rpm compared to 108 at 1,000 rpm in the previous model. Drawbar pull is 28,700 pounds, 3,500 pounds pull more than before. Other improvements are an engine balancer, a redesigned engine block, and a new fuel-injection system. For details circle 745 on card at page 18, or write to Caterpillar Tractor Co., Peoria 8, Ill.



The First Reference Book To Cover Every Aspect of Excavation and Earthmoving

Written by a contractor of twenty years experience who is a recognized authority in this field, MOVING THE EARTH contains detailed descriptions of exactly what operations the excavating contractor must perform on literally hundreds of different jobs. You'll also find in it a wealth of information on the operation, maintenance, and repair of just about every machine used in excavating work.

MOVING THE EARTH contains 1,200 pages and 1,200 photos that can show you the way to lower costs through more efficient operating methods that will also produce better work. The enormous scope of this book—truly "A Workbook of Excavation"—is indicated by the 15-page table of contents listing hundreds of topics.

21 chapters are divided into 2 parts. Part One deals with the work—describing every operation from digging a cellar to grading a superhighway. Part Two describes every important type of excavating and earthmoving machine—how it is made and why, what it will do and how to run it, and—above all—how to take care of it.

You may obtain your copy, on approval, from:

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MOVING THE EARTH

Published by North Castle Books, Greenwich, Conn.

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Ideal trencher for scores of jobs:

FOUNDATIONS
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DRAINAGE
IRRIGATION

Here's the handiest machine you ever owned —a fast, low priced, mobile tractor-mounted trencher for utility lines, foundations, sewer systems, septic tanks, etc. You'll find this ladder-type trencher working all the time. Cuts 6" to 20" wide trench down to a depth of 7'. Average digging speed 350' to 400' per hour — digs up to 800' per hour. Cuts through all soils the year 'round. Special chisel type cutters for rocky or frozen ground. Independent control of each drive wheel assures exact and easy regulation for either straight or curved trenches. Mounts on Ford or Ferguson tractor — easily driven from job to job — one man operated. Bulldozer blade available for backfilling. Write for all the facts today.

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PRODUCTS FOR BETTER FARMS, BETTER INDUSTRIES SINCE 1920

New Surveying Instrument Is Used Like a Transit And Checked Like a Level

■ Details on the newly announced Model 38-bF Warren-Knight transit-level have been released in a folder available on request. The new instrument features a horizontal limb vernier reading to one minute. Due to its unique type of construction, it can be adjusted like a Wye level.

Among features discussed in the literature is the 24-power internal focusing telescope with coated optics. In addition, a special combination of lenses permits a sharp focus as close as 5 feet. The telescope, with its axle, is mounted in V-bearings in standards similar to those of a transit. The instrument can be used for both lines and levels without removing the telescope from the standards.

To obtain this literature write to Warren-Knight Co., Dept. I, 136 N. 12th St., Philadelphia 7, Pa., or use the Request Card at page 18. Circle No. 726.

A list of coming conventions appears on page 112 of this issue.

CONTROLATOR

HYDRAULIC BOOSTER — HAND CONTROL
BRAKE LOCK — LINE PRESSURE GAUGE

INCREASED BRAKING AND HOLDING • PAYS FOR ITSELF • SAVES MONEY — TIME REPAIRS ACCIDENTS

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MUCH MORE THAN JUST A BRAKE LOCK

A Simple Powerful
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MOUNTED BETWEEN THE MASTER CYLINDER — OR BOOSTER — AND WHEELS

MASTER OF THE ROAD — AND LOAD
GIVES BRAKES WHETHER OR NOT THE MOTOR IS RUNNING — AND IN MOST CASES IF BOOSTER OR MASTER CYLINDER FAILS. *GIVES BETTER CONTROL* OF EVERY STOPPING, HOLDING, AND STARTING OPERATION—WHETHER THE TERRAIN IS ROUGH OR HILLY—OR THE LOAD LIGHT OR HEAVY.

DO MORE WORK — IN LESS TIME
YOU CAN GO WHERE YOU WANT TO GO—STOP—HOLD—RELEASE —AND GET OUT—*BETTER AND SAFER*, OR YOU CAN MOVE A FOOT OR MILE—UPGRADE OR DOWN—WITH NO *BACKROLL*, OR *LOSS OF CONTROL*.

THOUSANDS PRAISE ITS SAFETY AND DEPENDABILITY

YOU ALWAYS KNOW
THE BRAKE PRESSURE NEEDED OR APPLIED—AND CAN *CHECK THE SYSTEM FROM THE CAB* — FAST AND ACCURATELY

BRAKES EASILY RELEASED
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Easily Installed and Serviced
NO INTERFERENCE WITH CONVENTIONAL BRAKES

Offered By MANUFACTURERS — JOBBERS — DEALERS

POWER EQUIPMENT COMPANY
4000 Paseo • Kansas City, Missouri

The Model YT earth drill is the newest attachment for the Allis-Chalmers HD-5 diesel crawler tractor. Driven through the tractor power takeoff, the hydaulically controlled drill bores holes up to 24 inches in diameter. A pole setter is available to handle piles up to 45 feet long. For details circle 741 on card at page 18, or write to Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Box-type construction makes the Kolman Junior conveyor strong enough to carry a loading trap and large vibrating screen without supports. The boom section is of 3/16-inch steel plate pressed into a channel form 16 inches deep. This model is available in 18 and 24-inch widths and in 30 to 50-foot lengths. For details circle 742 on card at page 18, or write to Kolman Mfg. Co., Sioux Falls, S. Dak.

Varied Testing Services for Construction Industry

■ The testing services offered the construction industry by the United States Testing Co., Inc., 1415 Park Ave., Hoboken, N. J., are covered in a booklet available on request.

Among services listed are the field inspection of steel reinforcement placing, structural and tank erection, and piping and equipment installation. In the field of concrete, the concern offers sampling, testing, and analysis of portland and other cements, as well as aggregate tests.

Asphalt and tar, soils, pipe, and wood are among other building-material catagories for which tests are listed.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 693.

Threaded Inserts Simplify Work of Equipment Repair

■ Stainless-steel wire-thread inserts for equipment repair are now available in larger sizes, according to Heli-Coil Corp., Danbury, Conn. The threaded inserts are being marketed in Shop-Pack kits containing a quantity of inserts, a tap, and an inserting tool in a sturdy metal-edged box. Sizes range from 6/32 to 1½×6 inches, in both N. F. and N. C. series.

Wire-thread inserts provide strong permanent threads that are resistant to wear, corrosion, seizing, and galling in iron and steel as well as in aluminum, magnesium, copper, plastics, and wood. They have been used for several years in the repair of damaged, stripped, or worn threads.

The use of inserts replaces less efficient methods of thread repair such as tapping oversized threads for larger screws; welding, retapping and redrilling; and using bushings.

Only three steps are required in repairing a thread with an insert: drilling out the damaged threads; tapping new threads to accommodate the insert; and screwing in the insert.

For further information write to the company, or use the Request Card that is bound in at page 18 of this issue. Circle No. 737.

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Oldest and Largest Wheelbarrow Maker in America

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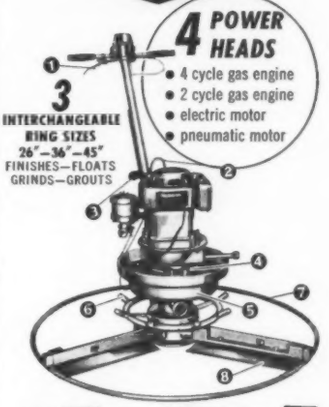

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MOST ADVANCED TROWEL BUILT

- New safety throttle control. If handle slips from hand, ring automatically stops and engine idles.
- New lifting eye for raising or lowering machine from one floor to another.
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- New clamp ring permits changing of power heads in seconds.
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- Powers floating disc for dry tamp floors and grinding-grouting head.

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Send me colorful descriptive folder on the new MALL POW'R TROW'L.
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FACTS ON FINANCE

Contradictory influences are at work in the economy at this time. Here and there, in official and unofficial circles, prosperity itself is begetting apprehension.

Construction remains high as 1955 rounds out its first quarter, but the feeling is spreading among businessmen that a letdown in activity may be looked for in the second half of the year.

Warning signs, however, are concerned with inflation rather than deflation or recession. Specifically, Federal Reserve officials are looking askance at the steady contra-seasonal rise in business borrowings from New York City banks. Leading the increase are stock market loans. These are up as much as $72 million in one week to a ten-year high. This brings the total to $700 million more than last year and well past the $1,500,000,000 mark. The national total of stock-and-bond-secured loans now exceeds $7,500,000,000—a new record.

Across the country, loans at leading banks are similarly rising, instead of falling off as they normally should at this time of year. To help meet this unforeseen demand, banks in turn are borrowing from the Federal Reserve System, which is watching the whole situation for "inflationary pressures".

The public debt is causing concern in some quarters. Onlookers particularly view with apprehension the rapidly mounting indirect federal obligations over and above the statutory debt limit of $275 billion. In addition to the great volume of outstanding FHA-insured and VA-guaranteed mortgages, and various contingent obligations of federally affiliated "instrumentalities", it is now proposed (these observers remind us) to finance a huge highway program under government sponsorships. The debt limit is to be "bypassed" through operation of "revenue authorities".

Such fears are ill-founded, though everyone concedes the necessity for wise and conservative administration. Unlike the bulk of "statutory" debt, which has to be met by taxation, toll-road securities in general are based on income and are presumably self-liquidating.

Instead of posing a menace in economic life, this type of highway financing may blaze a path back to private enterprise in an important section of the nation's economy. Texas recently broke ground for two privately financed "turnpikes". Plans call for one of them to be the longest toll road in the United States. Jointly, construction of the two turnpikes is heralded as opening up a new era for competitive nonpublic capital.

All this is not unprecedented. Early in the development of the country, it was not unusual for railroads to be state owned, state financed, and in some cases, state operated. The success of these projects encouraged private investors, who took over the bulk of railroad financing but remained "state aid" minded for more than a half century.

In the building field there are also signs that the trend of the governmental ownership-subsidy-guaranty of the past three decades is going into reverse. The banking world that welcomed FHA-insured and VA-guaranteed home loans is now showing signs of restlessness under government restrictions and is beginning to go ahead on its own as far as mortgages are concerned. In a typical move, one 55-year-old financial institution in Oregon announces a "free enterprise loan plan competitive with FHA and without dictatorial red tape" to run 25 years on 80-per-cent-value ratio. Non-governmental "Title I type" modernization loans are increasingly popular with banks across the nation.

This trend back toward independent operation on the part of bankers and private capital enterprisers cannot fail to benefit heavy construction by providing an additional channel of funds for a number of types of work. The need for such funds is mounting daily. In a single week last month, it rose to $373 million, 80 per cent higher than last year. Thus far, it is nearly 60 per cent ahead of last year's first nine-week cumulative total.

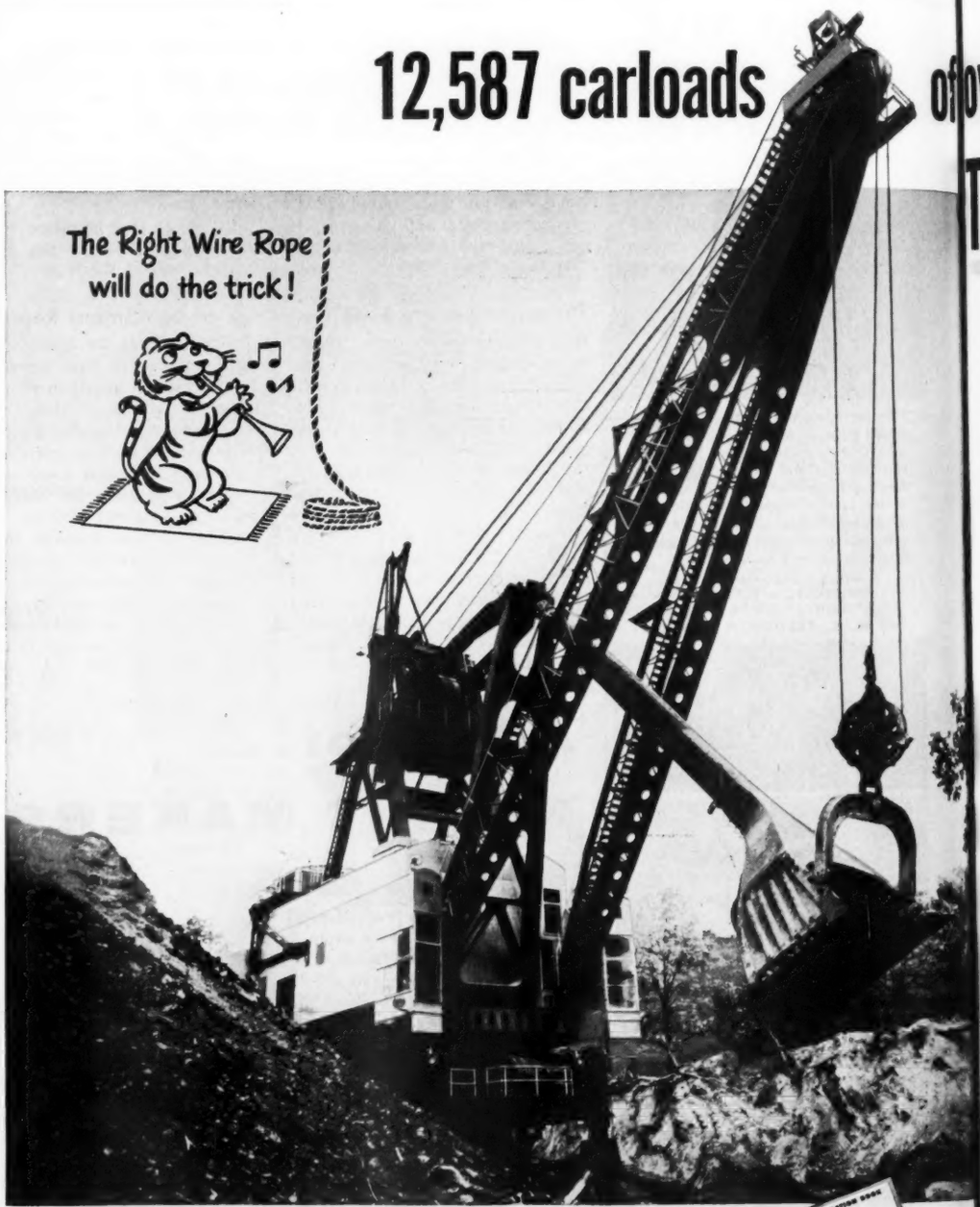
Barring unforeseen events—spiraling inflation, dangerous stock market fluctuations, and labor or international trouble—general economic factors will probably remain encouraging from a heavy-construction standpoint. At least five developments should spur construction in coming months:

1. Manufacturing and trade inventories are continuing to decline.

2. Bank clearings, one index of business activity, have passed the $20 billion weekly mark in 25 key cities and are running well ahead of last year. Southern and Pacific coast areas lead the way in this area.

3. Government's $14 billion re-

12,587 carloads of over



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by WILLIAM HURD HILLYER

funding and its 40-year 3 per cent bond flotation have not only pumped assurance into the money market but emphasized the Treasury's optimistic outlook.

4. Among municipal bond dealers, February's incipient frustration has given way to mounting enthusiasm. Large new flotations have been well absorbed and the "Bond Buyer" averages remained unchanged through the early part of March.

5. Long-time financing of two major corporations, replacing bank credit with long-term bonds, coupled with record-breaking investment demand for common stocks, indicates confidence in the future.

6. Industrial output is some 7 per cent higher than this time last year, though it was down a trifle as of March 1st.

Subject to reservations already noted, 1955 still looks like a good year for heavy construction, both in the public and private fields. The cost of labor and materials will doubtlessly increase, but with careful management contracts can be adjusted to take care of the rise. As for the money, despite heavy demand and hardening interest rates, banking and government officials join in the belief it will be available for contemplated projects. THE END

Insure your own personal security and that of the nation by regular investment in U. S. Defense Bonds.

# of overburden moved with one Tiger Brand Hoist Rope

IMAGINE 12,587 50-ton freight cars strung out end-to-end. They would make a train more than 80 miles long; and if each car was level full, the entire train would contain 1,000,000 cubic yards of material. That's how much overburden this big coal stripping shovel moved with one American Tiger Brand Hoist Rope.

Despite hard digging, a 2⅜" Tiger Brand Wire Rope lifted and lowered the fully loaded 45 cu. yd. bucket *20,000* times before it had to be replaced. This equipment is used by Central Ohio Coal Company which supplies coal for The Ohio Power Company's new Muskingum River electric power generating plant. This company also uses Tiger Brand Wire Rope on its 18 cu. yd. shovels.

You will like Tiger Brand, too. It lasts long in *any* type of service.

Send the coupon for our recommendations of the right rope to use on your machines.

Regular lubrication of sheaves helps prevent excessive wear of the Tiger Brand Ropes on these big machines.

This 18 cu. yd. electric shovel and the 45 cu. yd. job shown on the opposite page are stripping overburden 3 shifts a day *every* day at Central Ohio Coal Co.'s big Muskingum Mine near Zanesville, Ohio. Tiger Brand Rope is giving excellent service on both these hard-working machines.

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U·S·S AMERICAN TIGER BRAND WIRE ROPE

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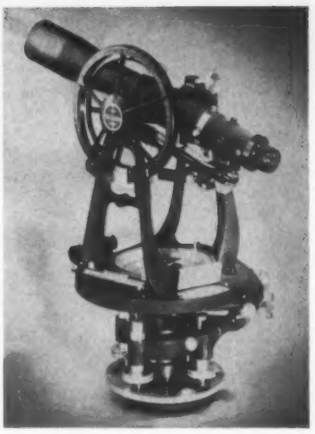


The 1955 model Berger bronze transit.

Line of Transits Features Improved Optical System

■ A newly designed optical system set to provide precise stadia readings at greater distances as well as a clear well-defined image is the feature of the C. L. Berger bronze engineers' transit line for 1955. The 6¼-inch model has a 26-power telescope with coated optics and a resolving power of 3½ seconds. Effective aperture is 1.430 inches, and the field of view is 1 degree 6 minutes. The use of an integrated rear bearing and eyepiece mount makes focusing smooth. The object is brought into sharp focus with a slow even motion by a negative lens actuated by a fine rack and pinion.

Fully enclosed nickel silver leveling screws precisely fitted into replaceable bronze bushings are standard on the new transits. Other improvements include a new circle guard and a non-reflecting compass plate finish. A reversion vial is standard equipment.

For further information write to C. L. Berger & Sons, Inc., 37 Williams St., Boston 19, Mass., or use the Request Card at page 18. Circle No. 612.

Plastic Safety Hat

■ A safety hat that protects workers from falling objects, electrical shock, and dripping fluids is offered by Welsh Mfg. Co., 9 Magnolia St., Providence, R. I. The Welsh-Guard Plastiglass hat is reported to withstand impact in excess of 40 foot-pounds.

The hat has high dielectric properties to protect against shock and is made of a resilient material that is moisture proof and will not crack or break. Equipped with a universal cradle, the hat can be adapted to any head size.

The hat is offered in brown and may also be obtained in other colors on special order.

For further information write to the company, or use the Request Card at page 18. Circle No. 637.

The Welsh-Guard Plastiglass safety hat.

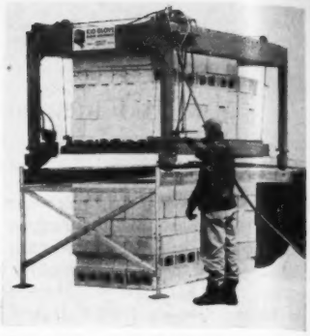
The P&H Model 2500C SpeedMaster white printer.

Hydraulic Block Unloader Lifts Without Pallet

■ A newly designed hydraulically-operated unloader handles blocks of all shapes and sizes without pallets, bars, or special attachments. The Imperial Kid Glove block unloader uses what is described as a hydraulic squeeze principle to exert pressure on the bottom tier of blocks so that it holds the entire cube securely. This is accomplished by hydraulic rams that bring rubber pads into firm contact with the blocks.

The unloader operates from a power takeoff. All operations are done with fingertip control. The machine handles 4 to 12-inch blocks and stacks cubes up to 8 feet high.

For further information write to Imperial Construction Equipment Co., 230 W. North Ave., Northlake, Ill., or use the Request Card that is bound in at page 18 of this issue. Circle No. 685.



Operating on hydraulic pressure of 100 psi, the Imperial Kid Glove unloader handles blocks without rods or pallets.

Improved Copying Machine

■ An improved whiteprinter introduced by P&H Sales Corp., 5640 N. Western Ave., Chicago 45, Ill., produces copies of tracings, drawings, charts, or letters at speeds up to 25 feet per minute. The SpeedMaster Model 2500C is a 2,500-watt machine operating on 230 volts 60 cycle ac. It uses the dry ammonia vapor method of true-to-scale diazo reproduction.

The SpeedMaster handles both cut sheets and rolled stock in widths up to 44 inches and in any length.

For further information write to the company, or use the Request Card at page 18. Circle No. 681.

Lippmann Adds to Staff

George D. Becker has joined the engineering staff at Lippmann Engineering Works, Milwaukee, Wis., as head of the engineering development department. Mr. Becker will be available, with others on the company staff, for consultation on the application of Lippmann conveyors, crushers, screens, and allied equipment in various operations.

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IT'S *CORRUGATED*
FOR EXTRA STRENGTH

Make an IGLOO water cooler standard equipment for your construction crews! You can't match a sturdy Igloo for toughness and durability. Its fully-corrugated, all-steel galvanized construction outlasts—and out-cools—the old-time water barrel by years. Put an Igloo on the job—it's the world's *best* portable cooler!

CHECK THESE SUPERIOR FEATURES:

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- Reinforced ribbed lid
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- Extra bottom support

2, 3, 5, 10 and 15 Gal. Sizes
Stainless Steel Liners Available

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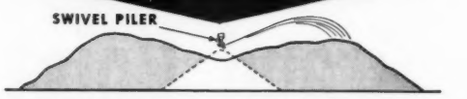
Increase Storage Capacity Up to 10 TIMES



Notice how the addition of a Swivel-Piler will increase the storage volume of a conveyor, without moving the conveyor.

S-A SWIVEL-PILER
for conveyor mounting

The S-A Swivel-Piler, quickly and easily mounted on the end of your conveyor, will increase your storage range 10 times and eliminate frequent conveyor moves . . . saving you hundreds of dollars. This simple, centrifugal thrower unit throws almost any bulk material, up to 2" lump size. User always has complete control over the path of discharge.

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NEW Littleford-Clarkmoore Asphalt Road Heater-Planer
Heats and Planes in one continuous operation!

engineered unit for heating and planing bituminous roads, streets and runways

No other unit like it! This ingenious new machine—with one man at the controls, and in one continuous operation—heats and planes off high crowns, corrugations, eliminates troughs and ruts. Performs these and many related operations as slowly as 8-in. per minute, or as rapidly as 88-ft. per minute. For complete information send for bulletin 18.

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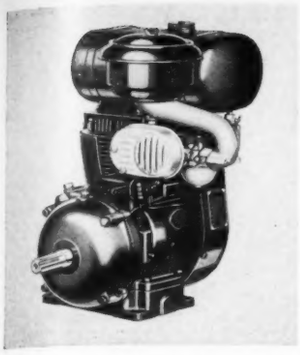

The Kohler Model K160R engine features a reduction unit providing a 6:1 gear ratio.

Engine Equipped for Low Power-Takeoff Speeds

■ An addition to the Kohler air-cooled engine line, the Model K160R, is equipped with a reduction unit providing a 6:1 reduction gear ratio for applications requiring low power-takeoff speeds. Clockwise or counter-clockwise crankshaft rotations are available.

The K160R, weighing 88 pounds, includes a rotating grass screen, an oil-bath air cleaner, a flyball governor, and ball bearings at both ends of the crankshaft.

For further information write direct to Kohler Co., Kohler, Wis., or use the Request Card that is bound in at page 18 of this issue. Circle No. 674.

Booklet on 2-Way Radio Shows Its Applications

■ A new booklet from Radio Corporation of America, Camden 2, N. J., describing the uses of two-way radio in industry, has a section on the application of mobile radio equipment in construction.

The booklet also describes how the Federal Communications Commission controls the available channels and how the Frequency Allocation Committees work. It explains the means of procuring a two-way radio system, describing the various steps from planning and installing to operating and servicing.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 694.

Main Runway of Rome (Italy) Airport Completely Resurfaced in Record Time

with the

H&B ESTABLISHED 1867

MOTO-PAVER

Runway in daily use while being resurfaced

● An unusually difficult construction job was completed in record time recently when the main runway of the Ciampino Airport at Rome, Italy, was completely resurfaced in two weeks with a single Moto-Paver. The runway measured 60 meters wide and 400 meters long, which meant resurfacing 24,000 square meters. What made the job especially hard was the fact that the runway was in daily use at the time, and could be worked on only three hours each day. The Moto-Paver laid a strip 3.1 meters wide, at a rate of 100 tons per hour. 4,000 square meters were laid every three hours. The material was rolled two hours after it was put down. On the following day it was rolled for a final setting. Asphalt used on the project was a RC-3 specification, and the aggregate was a dense graded siliceous chipping mix.

This is just another example of how the H&B Moto-Paver—in all parts of the world and under all kinds of conditions—is speeding the resurfacing job, and cutting the cost.

New Bulletin MP-55 will be sent on request.

HETHERINGTON & BERNER INC.

ENGINEERS . . . MANUFACTURERS

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MIX and PAVE— *all in ONE operation!*

THE BURCH MODEL 12 PAVER and RESURFACER

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Mixes, spreads, and levels bituminous material 10 to 12 feet wide in ONE pass. Material is rolled and mixed FOUR times. Easily adjusted to spread uniform thicknesses over varying contours. Wheel base is 22' 10". The Burch Paver is tractor-pulled — but its operation is hydraulically controlled, with power supplied by a self-contained gasoline engine.

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MANUFACTURERS OF EQUIPMENT FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND STREETS

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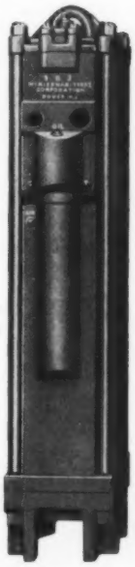


McKiernan-Terry 983 Double-Acting Pile Hammer

About the most difficult part of the recent pier construction job at the port of Portland, Oregon, was driving the piles of many different types.

Part of the pile driving job consisted of a number of circular cells as shown in the illustration, and for this part of the work McKiernan-Terry 9B3 Double-Acting Pile Hammers were used, freely suspended from crane boom, arranged so that 3 pile sections were driven simultaneously. Consulting Engineer, Frederick R. Harris, New York; Contractor, Guy F. Atkinson Co., San Francisco.

Here, as at construction projects all over the world, McKiernan-Terry Hammers were used to simplify pile driving operations.

McKIERNAN-TERRY CORPORATION

MANUFACTURING ENGINEERS

Also Manufacturers of Coal and Ore Unloaders and Bridges, Grab Buckets, and Special Machinery

82 RICHARDS AVE., DOVER, NEW JERSEY

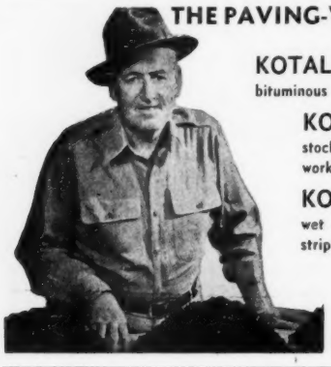
McKIERNAN TERRY

MK 3404

Metalweld Appointments

James Sheehan, formerly in charge of rentals in the construction machinery division of Metalweld, Inc., has been appointed to handle the special development of sales and service in the Esco line of dragline, clamshell, and material-handling buckets, together with other equipment manufactured by the company.

Joseph P. Greene, Jr., has joined the company as a sales trainee in the rental and service department.



THE PAVING-WISE ROAD MAN KNOWS—

KOTAL PROCESS makes a tougher more durable bituminous mix and assures a superior pavement.

KOTAL PROCESS water and weatherproof stockpile-mixes can be used for road maintenance work all year 'round.

KOTAL PROCESS is excellent for coating wet aggregate and producing mixes that will not strip even under severest conditions.

Write for up-to-date laboratory findings.

KOTAL COMPANY

360 Springfield Ave. Summit, N. J.

The new Bay City 15-ton Cranemobile.

Medium-Capacity Crane In Truck-Mounted Model

■ A 15-ton-capacity truck-mounted crane is now offered by Bay City Shovels, Inc., Bay City, Mich. The new model 151-T41 now gives the Cranemobile line a machine suitable for many small and medium-size jobs.

The machine's carrier mounting is designed especially for crane service. It is powered by a 404-cubic-inch-displacement Hercules gasoline engine, and has single wheels in front and dual tandem wheels in the rear. Flotation is provided by ten 10:00×20 twelve-ply mud and snow-grip tires.

A heavy-duty main transmission with 3-speed auxiliary provides 12 forward speeds to a maximum of 44 mph, and three reverse speeds. Front and rear extensible outriggers are standard equipment.

The new Cranemobile weighs 41,500 pounds with standard equipment, including a 30-foot boom. The weight is distributed well with 15,850 pounds on the rear axles and 9,800 pounds on the front axle, allowing travel on most highways without a special permit.

The crane boom is of the pin-connected type, of lattice construction, and is supported by a cable-suspended floating bridle. This is arranged so that the boom may be lengthened by the addition of center sections without changing the hoisting cable. Maximum recommended boom or boom and jib combination is 75 feet. The basic boom is in two sections of 15 feet each with center sections of 5, 10, and 20-foot lengths. Matching pendant cables are furnished with each boom section. Telescopic boom back stops provide additional safety when the boom reaches the maximum operating angle.

A power load-lowering mechanism furnished as standard equipment will allow a minimum controlled lowering of about 1-inch per second. The independent boom hoist operates either independent of or simultaneously with any other combination of crane motions.

For further information write to the company, or use the Request Card at page 18. Circle No. 629.

A recent study made by the New York Department of Public Works, in cooperation with the United States Bureau of Public Roads, discloses that the incidence of accidents is greater among drivers who smoke than among non-smokers!

Oliver Super 77 with hydraulic front loader

Presenting . . . the Brand-New

OLIVER SUPER 77 and 88

Super new power . . . features . . . value!

Here are the newest tractors in the industrial field—the Oliver Super 77 and 88!

Here is power like never before. And both Supers offer a choice of gas or diesel engine. The gas engine has a compression ratio of 7.0:1 to give you more power on less fuel. And the diesel is a full diesel—starts and runs on diesel fuel alone. Pick the fuel that fits your work, saves the most.

Here are tractors that have the features you want—five working speeds, one road speed; long-lasting double-disc brakes; easy ball-type steering; comfortable rubber spring seat; Independent Rear Power Take-Off and many other advancements found only on Oliver Supers.

These tractors take a variety of equipment . . . are useful on hundreds of different jobs. Test them yourself. Find out why an Oliver Super is your best buy for power, features and value—now, and for years to come! See your Oliver Industrial Distributor for a demonstration.

THE OLIVER CORPORATION

400 W. Madison Street, Chicago 6, Illinois

A complete line of industrial wheel and crawler tractors

Oliver Super 88 with HydroTrencher. This trencher has a ½-yard capacity and quick, positive hydraulic control. It digs to 12 feet, loads to 12 feet.

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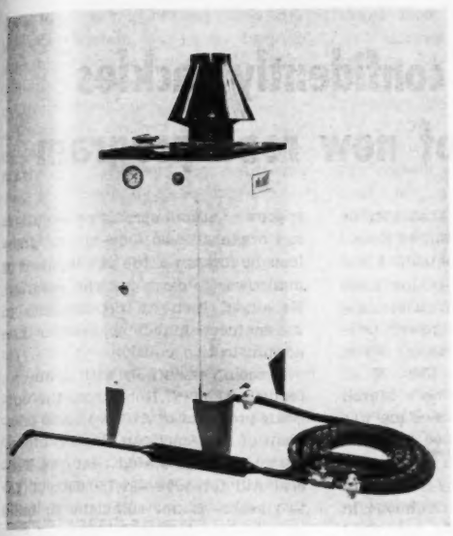


This small Malsbary cleaner, working directly off watermain pressure, delivers 60 gallons per hour of solution heated to 325 degrees F at 50 psi.

Small Steam Cleaner For Washing Equipment

■ A small Malsbary steam cleaner, just announced, works directly off regular water mains where water pressure is 60 pounds or greater. The Model 60 cleaner reaches working temperatures in two to three minutes delivering 60 gallons of hot solution per hour at 50 psi or more. For use where water-main pressure is below 60 pounds, the manufacturer offers a simple booster-pump assembly which bolts directly to the cleaner.

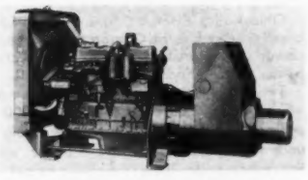
The operator controls the cleaner at the nozzle. When the valve on the cleaning nozzle is shut, the burner automatically shuts off. A safety vacuum breaker on the incoming water line prevents the solution from backing up into the fresh water supply. If the water line is accidentally broken or the water flow cut off, the burner automatically shuts off, preventing coils from burning out.

The Malsbary Model 60 uses liquid detergent, which feeds directly from a tank to the water entering the heating coils. Strength of the cleaning solution is determined by a solution-metering valve.

For further information write to Malsbary Mfg. Co., 845 92nd Ave., Oakland 3, Calif., or use the Request Card at page 18. Circle No. 631.

Electric Generating Plant Is High-Capacity Unit

■ A new Onan electric generating plant of 75,000-watt capacity is reported to have excellent starting qualities. Designed for emergency ap-



plications, the new plant will also provide continuous heavy-duty service.

Driven by a Continental 6-cylinder gasoline engine, the Model 75 HR generating plant will provide either 75,000 watts of 60-cycle ac at 1,800 rpm engine speed or 60,000 watts of 50-cycle ac at 1,500 rpm.

For further information write to D. W. Onan & Sons Inc., University Ave. S. E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 606.

USE THE RIGHT ROLLER for the JOB

MOTOROLLER 125 is designed especially for HOT TOP PAVING

DON'T TIE UP HEAVY EQUIPMENT

when a Motoroller 125 will roll asphalt and bituminous surfaces including subgrades. This one ton roller can be carried easily from job to job to be there when you need it. See your MOTOROLLER dealer now! NEW LOW PRICES, IMMEDIATE DELIVERY

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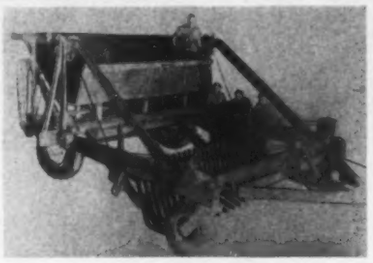
WINDSOR LOCKS, CONN.

DEALERS: Selected territories open to qualified houses



Do you have a . . . ROCK PROBLEM?
Here's your Speedy, Low Cost Answer . . . the BESTLAND Hydraulic
ROCK PICKERS!
In world wide use on many major projects!

In use at Tiber Dam, Palisades Dam, etc. These units are speedy and rugged. Just pull lever to raise loaded tines to hopper box and to discharge hopper box load to truck. You never leave the tractor seat. Spacing of tines adjustable on all models. Picks small rocks to huge boulders.

7 MODELS TO CHOOSE FROM—There's a unit to fit your need.

SELF MFG. CO., Twin Falls, Idaho

You Can Be SURE, Too if it's a ROGERS TRAILER

In purchasing this 100 ton transformer The Consumer Power Company of Flint, Michigan, showed faith in the Westinghouse slogan "You Can Be SURE If Its Westinghouse."

In placing a large percentage of this load on one of their Rogers Trailers, P. Van Harren & Sons of Bay City, Michigan, again displayed their faith in the rugged dependability and braking reliability of these trailers.

This transformer, the heaviest load ever moved over Flint Streets, measured 20' x 15' x 10'. The move was made under the supervision of Venus and Russell Van Harren with Jacob Smith as rigger foreman.

You, too, can place the utmost confidence in Rogers Trailers, regardless of the type needed or the difficult nature of the loads it will be required to haul.

YOU GET MORE FOR YOUR MONEY IN A ROGERS TRAILER
EXPERIENCE builds 'em ROGERS PERFORMANCE sells 'em
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ALBION, PENNA. CABLE: BROSITES

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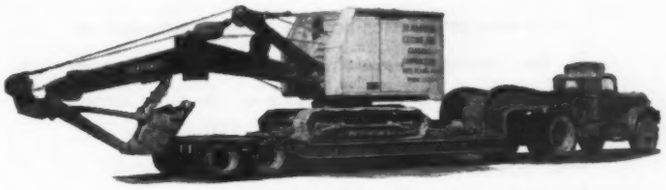

A Rogers Type "D" Trailer

GIVE TO CONQUER *Cancer*

Russell H. McCain, (second from left) chairman, Maryland State Roads Commission is the new president of Association of Highway Officials of North Atlantic States. Flanking him is (left) assistant secretary and treasurer K. D. Rice, New Jersey State Highway Department, and (right) vice president W. A. McWilliams, chief engineer, Delaware State Highway Department. At extreme right is A. Lee Grover, New Jersey State Highway Department, secretary and treasurer.

C&E Staff Photo

AHONAS confidently tackles problems of new road program

The various problems that can be expected in handling President Eisenhower's $101 billion expanded highway program was the major topic discussed at the 31st annual meeting of the Association of Highway Officials of the North Atlantic States last month in Atlantic City, N. J. Held at the Hotel Traymore March 2 through March 4, the meeting was attended by more than 900 delegates from 11 states, as well as the District of Columbia. The highway authorities present were virtually unanimous in their confidence that the new road program could be handled effectively.

At the first session, "A Report From Washington", by A. E. Johnson, executive secretary of the American Association of State Highway Officials, stressed the importance of keeping the highway program on a nonpartisan basis. Johnson's report, read by Jack Wiley, assistant executive secretary of AASHO, also urged highway officials make unified decisions to influence Congressional action on the program.

The executive secretary expressed confidence that highway departments could handle any program Congress approves without consulting engineering organizations. One of the problems he foresaw is the development of manpower to carry out the program. He urged highway departments to use engineers in technical rather than administrative positions.

Agreeing essentially with Johnson's report was J. N. Robertson, the outgoing president of AHONAS and president of the American Road Builders' Association. He stated that the Federal Aid for 1954—$1,750,000,000 for two years—is not sufficient to build an adequate interstate highway system.

Robertson said that there is approximately $10 billion to $16 billion worth of highway projects already planned and designed. He reported that a period of 21 months will elapse from the allocation of funds to the actual construction of new Federal-Aid projects. Of this 21 months, 17 months is needed for planning and design, 2 months for advertisement and awarding of bids, and 2 months for the contractor to set up operation at project locations. Regarding the final locations of roads, Robertson mentioned the possibility of linking

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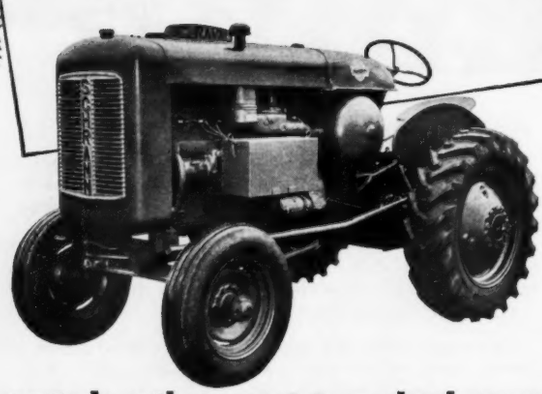
A SELF-PROPELLED AIR COMPRESSOR



that costs less than most two-wheel mounted air compressors!

Schramm's new *standard* ***Pneumatractor*** makes big news. . . initial low cost and low operating costs!

Initial low cost . . . due to mass production! You get a $1700.00 tractor plus a $3500.00 portable compressor **combined for $3675!**

Low operating cost as it is a compressor and tractor which means you need only one operator . . . one engine to service . . . one fuel tank to fill . . . one order to fill!

This new compressor has the same power unit as in the Heavy ***Pneumatractor*** and ***Pneumapower*** portable compressor and many of its parts interchange with the Unistage Model 210 engine and compressor. It provides 125 c.f.m. at 100 pounds . . . has high road clearance!

Send today for Catalog 5545.

SCHRAMM, INC.

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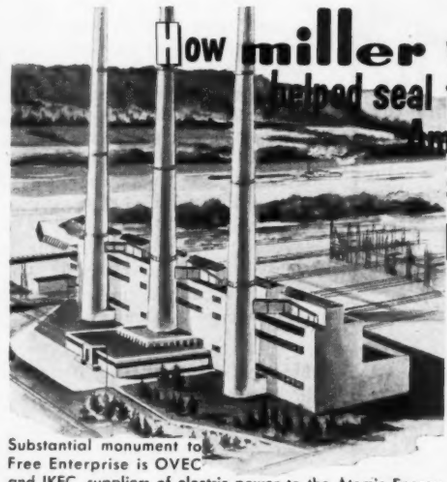
SCHRAMMAIR YOUR JOBS

How miller welders helped seal the arteries of America's largest single purpose power plant...



Substantial monument to Free Enterprise is OVEC and IKEC, suppliers of electric power to the Atomic Energy Commission's new uranium diffusion center in Pike County, Ohio.

Miller Selenium Rectifier d-c Arc Welder, in four wide-range models. For complete, concise, worthwhile information on these and other Miller Arc and Spot Welders, contact us today . . . at no obligation, of course.

Ohio Valley Electric Corporation and its subsidiary, Indiana-Kentucky Electric Corporation, agreed to supply electric power to this great new atomic production center . . . *15 billion kilowatt-hours annually.*

Two huge generating stations are being built: The Kyger Creek Plant at Cheshire, Ohio will have five generating units of 200,000 KW each; Madison, Indiana's Clifty Creek plant will produce 1,200,000 KW with its six big generators. Each of the eleven turbo-generating units will operate off a single boiler, with super-heated steam reaching 1,050 degrees Fahrenheit under 2,000 lbs. pressure per square inch! The high temperatures and reheat, which the sponsor companies have pioneered in their own right, will make these two plants among the most economical, most efficient generating stations in the country.

These same elements, however, make the fabrication of faultless high-pressure steam lines vital . . . and extremely difficult. To accomplish this extremely important task, pipe welding specialists equipped with the maximum of engineering skill utilized the Miller Selenium Rectifier d-c Arc Welder.

". . . . if it's Miller, you *know* it's the *finest!*"

miller ELECTRIC MANUFACTURING COMPANY, INC.

APPLETON, WISCONSIN

Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal, P.Q.

rural and urban regions with the interstate system. But he emphasized that highest priority should be given the interstate system because of its military importance.

Robertson stressed that it is important for legal authorities to set up machinery for acquiring rights-of-way, thus avoiding delay when construction is ready to start. As for the engineering requirements, he suggested that highway departments use standard plans and designs, on-the-job training for engineer graduates, and a better salary scale to attract necessary engineers.

Disagreeing with Johnson's paper on one point, Robertson stated that consulting engineering firms should be used for developing plans and designs so that personnel requirements of highway departments might be reduced when the expanded highway program gets under way.

In the talks that followed, some highway men indicated they felt that highway departments should turn part of their responsibilities over to consulting engineering firms rather than build up their forces to cope with the expansion.

C. D. Curtiss, U. S. Commissioner of Public Roads, speaking at the second session, urged states to study their requirements and submit their recommendations, by April 1, "with regard to location of the system in the vicinity of urban areas." This would permit an estimate of total mileage required. Use of standard plans and designs, removing engineers from non-engineering duties, on-the-job training, and better salaries as inducements for recruiting engineering graduates, were also suggested by Curtiss.

Toll Roads

The advantages and disadvantages of toll roads were discussed by a panel at the second session. Charles M. Noble, chief engineer of the New Jersey Turnpike Authority, illustrated some advantages by describing the excellent patrol and maintenance setup on the turnpike.

Disagreeing with Noble, H. A. Flanikin, highway engineer with the American Trucking Association, declared that toll roads should exist only where state authorities deem it necessary and where state funds are not available to build comparable roads. Like Noble, he attributed the success of toll roads to increased safety and ease of travel, but he added that free roads, if built similarly, would be just as successful.

The method of financing is the main difference between toll roads and expressways, said Gerard B. Gilbert, assistant to the chairman of the Pennsylvania Turnpike Commission. In his talk, Gilbert pointed out that the former are built with money borrowed from investors and paid for with interest in a given time by toll receipts. The general funds of the state, he added, are sometimes used to insure the principal and the interest of the investors. The assistant chairman mentioned that toll roads can be built where state funds are not available.

Because of the low rate of return, the Prudential Insurance Company has not invested in roads at all, according to Robert C. Fowley of the company's bond department. Fowley said federal reimbursement for toll roads will be used to pay off the existing balance of debt so that the roads can become expressways, or to build new highways in the state.

Baltimore Harbor Crossing

A technical paper dealing with the proposed construction of twin tubes

(Concluded on next page)

D. G. Palmer, (left) New Jersey state highway commissioner, shows a model of the new Delaware River Bridge approach system to W. A. McWilliams, the new vice president of Association of Highway Officials North Atlantic States, at the Association's annual meeting last month in Atlantic City.

C&E Staff Photo

HERE'S PROOF THAT A-W GRADERS WITH ALL-WHEEL DRIVE HAVE 30% MORE POWER AT THE BLADE

To calculate Power-at-the-Blade, it is necessary to determine (1) skid pull due to traction and (2) maximum rim pull due to engine; using the formulas at the right, which are those used by manufacturers of tires and farm tractors.

The *effective* Power-at-the-Blade will be the *lesser* of the two figures. If you have more power than is necessary, and insufficient weight on driving wheels, you will slip the wheels, making SKID PULL the *limiting factor*. If you have insufficient power to slip the wheels, RIM PULL due to engine will be the *limiting factor*.

SKID PULL (DUE TO TRACTION)

SKID PULL = W x f

W = WEIGHT ON DRIVERS
f = FRICTION COEFFICIENT BETWEEN TIRES AND GROUND

MAXIMUM RIM PULL (DUE TO ENGINE)

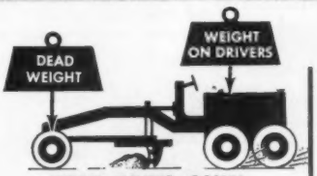
$$\text{RIM PULL} = \frac{T \times 12 \times R}{Y}$$

T = ENGINE TORQUE AT PEAK (INTERMITTENT RATING)
R = TOTAL RATIO, ENGINE TO REAR WHEELS
Y = LOADED RADIUS OF TIRE (INCHES)

EFFECTIVE POWER AT THE BLADE WILL BE THE LESSER OF THE ABOVE TWO FIGURES

Working in average dirt in first or second gear, all graders have more than enough weight to spin their drivers; therefore Skid Pull is the limiting factor, and the measure of comparative performance. The Austin-Western Power Grader, with its exclusive All-Wheel Drive, has 30 per cent more weight on driving wheels than any other grader; consequently moves 30 per cent more material . . . it's as simple and inescapable as that.

HERE'S WHY A-W GRADERS DELIVER MAXIMUM POWER



REAR DRIVE ONLY

No grader with a dead front end can possibly deliver maximum power at the blade. Weight carried on the idling front wheels of the conventional tandem-drive grader is *dead* weight, contributing nothing to traction—*lazy* weight, consuming power to no purpose. Every pound of weight not carried on a driving wheel *handicaps your horsepower.*

ALL-WHEEL DRIVE

On the Austin-Western Power Grader there are no idling front wheels—no dead front end to consume power and decrease efficiency. Every pound of weight rides on a driving wheel. Every pound is working weight—contributing 100 per cent to traction, utilizing the torque of the engine to best advantage, delivering maximum power where it counts—*at the blade.*

Austin-Western
Power Graders · Motor Sweepers
Road Rollers · Hydraulic Cranes
Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

KIESLER
Since 1892
2-LEVER ARM
CLAM SHELL BUCKETS
with
POWER
ON BOTH SHELLS
"A PAYLOAD EVERY TRIP"
The ONLY Bucket that DIGS-IN instead of Lifting-Out.
Write for literature
JOS. F. KIESLER COMPANY
934 W. HURON ST. CHICAGO 22, ILL.

(Continued from preceding page)

under the Baltimore Harbor was presented at the third session by Bruce Herman of the J. E. Greiner Co. The project, due for completion December 1, 1957, is 15.2 miles long and consists of 13.5 miles of high-speed expressway approaching 1.7 miles of tunnel. A total of 9 to 11 interchanges will provide access to the tunnel approaches. The twin tubes, with four lanes of traffic, will be placed by the trench method.

Panel on Highway Problems

"The Highway Administrator and His Problems", discussed by a panel consisting of highway officials from four states, was concerned with such problems as program planning, legislature relationships, minority pressure groups, and stability of tenure. The panel used concrete examples to illustrate how these problems were solved in the respective states.

Another panel discussion at the fourth meeting dealt with the problems of "Limitation of Access and Roadside Control". All panel members agreed that prompt action to obtain rights-of-way well in advance of actual construction was imperative. A recommendation for a 300-foot-wide right-of-way was made by A. C. Clark, deputy commissioner, U. S. Bureau of Public Roads. He said that federal assistance will be available to the states if and when difficulty arises in obtaining the rights-of-way for controlled access roads.

New York-New Jersey Traffic

A proposed construction program to ease New York City's traffic problems was detailed in "Vehicular Horizons in the New Jersey-New York Metropolitan Area", a technical paper presented by Edward G. Wetzel, assistant chief of the planning division of the Port of New York Authority. The growth of New York City, Wetzel estimated, will cause traffic crossing the Hudson River to swell to 105 million vehicles annually by 1960. To ease this New Jersey-New York traffic, a third tube of the existing Lincoln Tunnel is now under construction and a bridge across the Narrows, connecting Brooklyn and Staten Island, has been proposed. This bridge will be the largest suspension bridge in the world. Another span, Throgs Neck Bridge, will be built across Long Island Sound, linking The Bronx and Queens with a network of expressways.

Work Capacity Gaged

"The Contractor's Place in the Highway Construction Program" by Dwight W. Winkelman, of D. W. Winkelman Co., New York, N. Y., was read by Arch Carter of the Associated General Contractors of America.

His report outlined these recommendations AGC has made to Congress:

1. National and state highway-construction programs should be established on a continuing basis, preferably for a period as long as ten years, and should be carried out in an orderly manner at a known rate in each of the years.

The basis for this recommendation was the theory that contracting organizations can secure trained personnel and equipment if they can count on a construction program of a known size each year.

2. Steps should be taken for adequate provisions for the purchase of right-of-way well in advance of construction. It is costly for both the public and contractors if operations must be suspended while land is being secured.

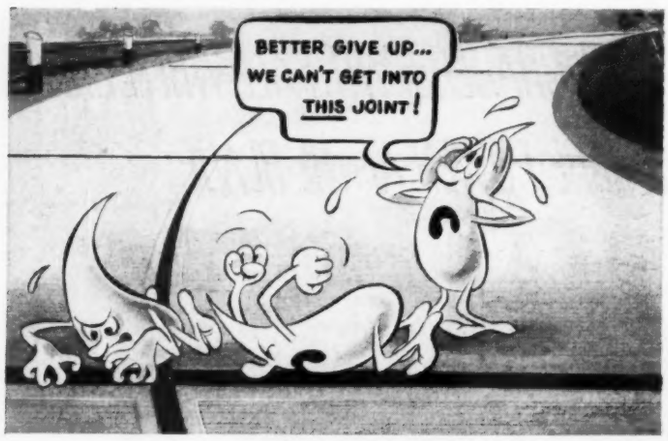
3. An expanded construction program, however financed, should be administered through the present channels of the Bureau of Public Roads and state highway departments.

4. The expanded program should be carried out under the contract method which safeguards public funds, with contracts awarded to the lowest responsible bidder after public advertisement.

Officers

AHONAS elected as president for 1955-56 Russell H. McCain, chairman of the Maryland State Roads Commission. The vice president is William A. McWilliams, chief engineer of the Delaware State Highway Department. A. Lee Grover will serve as secretary and treasurer. Assistant secretary and treasurer is Kenneth D. Rice. Both men are with the New Jersey State Highway Commission.

Next year's meeting will be held in Boston. This was the fourteenth meeting held in Atlantic City.



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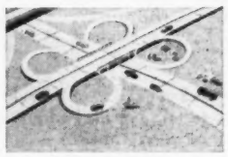
Count on this popular rubber-asphalt compound to keep your concrete road joints free from costly water seepage. Year after year. Without re-pouring.

Flintseal stays extensible and compressible through all weather . . . through expansion and contraction of slabs. It won't crack in cold . . . won't flow in heat. Bonds firmly . . . to keep water and dirt out of joints.

Flintseal (hot-poured), Flintseal JFR (jet-fuel-resistant) and Flintkote Cold Poured Sealers meet state and federal specifications. Accept nothing less than these rubber bearing joint-sealing compounds for positive long-lasting sealing, and economical maintenance.

Ask for literature and application data for roads, streets and airfields.



You find Flintseal is *super* for super-highways. One application lasts for years and years.

Flintseal bonds to joint walls perfectly. Keeps pavement maintenance costs down.

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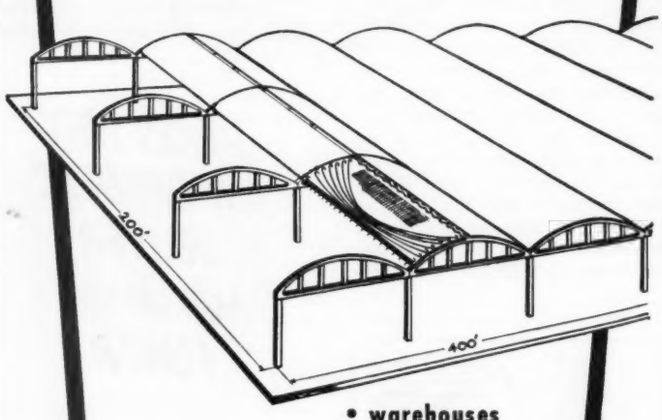


- warehouses
- factories
- low cost housing

VACUUM CONCRETE, INC.
4210 Sansom Street • Philadelphia 4, Pa.

The improved C-10 model of the Henry hydraulic backhoe has a maximum loading height of 8 feet. ▼

Hydraulic Backhoe Gets Added Power and Reach

■ The Henry hydraulic backhoe for tractors has been redesigned to offer more power, a greater digging depth, and a higher loading height than previous models. The hydraulically operated boom of the new Model C-10 digs to 10 feet 6 inches deep and can load at a height up to 8 feet. A boom that digs 8 feet deep is also available for the unit.

The Model C-10 also has a new type of parallel circuit control valve with free oil flow which, it is pointed out, permits digging and dumping in one continuous and smooth action. An improved regulator valve adjusts downpressure to suit digging conditions. The machine has replaceable bronze bushings and large-diameter pins at all pivot points.

The backhoe digs from one position at any angle within a swing radius of 160 degrees. The hydraulically-controlled main frame rests on 6½ square feet of ground, stabilizing the machine sufficiently to permit it a reach of 16 feet.

For further information write to the Henry Mfg. Co., Inc., 1700 N. Clay St., Topeka, Kans., or use the Request Card at page 18. Circle No. 667.

Fill Connecticut Posts

The new Connecticut State Highway Commissioner is Newman E. Argraves, Hamden, who assumed office March 1. Howard S. Ives of Mystic has been appointed deputy commissioner.

Mr. Argraves formerly headed the consulting firm of Newman E. Argraves & Associates, New Haven, Conn. Deputy Commissioner Ives has been a member of the state's highway department for more than 30 years, serving most recently as engineer of surveys and plans.

Details on Self-Propelled Concrete-Hauling Cart

■ A concrete-hauling cart of heavy construction is illustrated in literature from Kalamazoo Mfg. Co., 1827 Reed, Kalamazoo, Mich. The Kal-Truk has a 2/3-cubic-yard dump body that can hold up to 3,000 pounds. It can haul at 15 mph.

The literature shows the Kal-Truk being used in various parts of a concrete-pouring operation. Views from several angles show the unit's construction features. Specifications and diagrams provide complete details.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 717.

THE "O'HADI" ALL-WEATHER PATCHER

The practical asphalt maintenance machine.

Heats the hole and the mix simultaneously.

Heats without burning.

Shears the hot patch smooth and level.

FAST — ECONOMICAL — PERMANENT

Write for full information.

BUHL MACHINE WKS., Buhl, Idaho

STOP trucks from "bogging down" in mud!

Rugged and dependable, easily assembled, low in cost, 2,500 tons of Road Mats. Ideal for sand, dirt, mud.

Sold in any quantity

May be used as planking, concrete reinforcing, etc.

ALTER CO., Davenport 1, Ia.

MORE POWER To Move MORE ROCK

HERE'S a big new shovel that, pound for pound, can't be beat for output in rock. It's the Bucyrus-Erie 71-B — a modern 3-yd. excavator that delivers the power and speed you need for really effective digging.

A strong yet lightweight boom, large diameter twin boom-point sheaves, rectangular inside dipper handle, fully independent boom hoist, and positive twin-rope balanced crowd with single rope retract — all these combine to give the 71-B a balanced and rapid work cycle for continuous high output. Perfectly matched to the front end equipment are a sturdy crawler mounting that forms a solid working base, a diesel engine with torque converter drive for added efficiency and smoother operation, and simple, compact main machinery with anti-friction bearings used liberally throughout to reduce wear and power loss from friction.

83E54

Look over these important 71-B features. Consider what they will mean to you in extra output. Then get complete details on the 71-B from your nearby Bucyrus-Erie distributor.

Choice of A-frames offered: standard high or low A-frames or power-controlled high or low A-frames.

Positive twin-rope balanced crowd combined with single rope retract produces power and speed as needed for high output work cycles.

All-purpose heavy-duty dipper combines long-lasting strength with streamlined design for easy loading, fast dumping.

There's full air control, not just air assist, on all operating clutches plus steering and digging brakes.

Torque converter drive automatically balances speed and torque to match the load, smooths operation throughout.

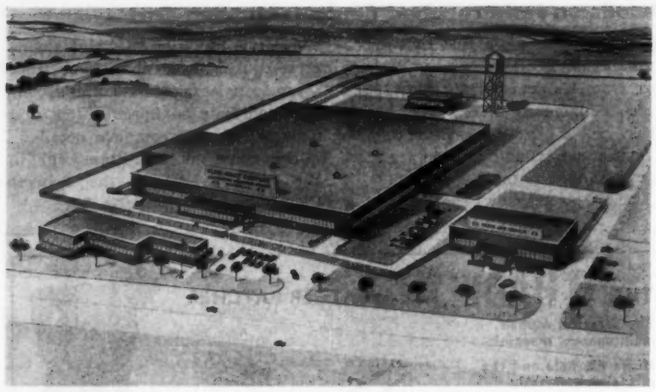
Four sizes of crawler mounting — standard, standard wide, long-wide, and long-wide-tapered — for efficient operation on all terrain and under all working conditions.

Revolving frame is a one-piece annealed steel casting of wide, deep box-section design, providing a firm stable base for main machinery.

Twelve conical hook rollers make swinging smooth and easy, distribute the load between upper and lower works.

BUCYRUS ERIE

South Milwaukee Wisconsin



Work will start this month on the Mattoon, Ill., home of the construction equipment division of Blaw-Knox Co., Pittsburgh, Pa. The new plant will consolidate the company's road-equipment manufacturing operations.

New plant to coordinate Blaw-Knox operations

Construction of a new multi-million dollar plant will be started by Blaw-Knox Co., Pittsburgh, Pa., with ground-breaking ceremonies the 19th of this month at Mattoon, Ill. Both W. Cordes Snyder, Jr., president of the firm, and Robert P. McKenrick, vice president, will be on hand to see work get started on the 40-acre facility.

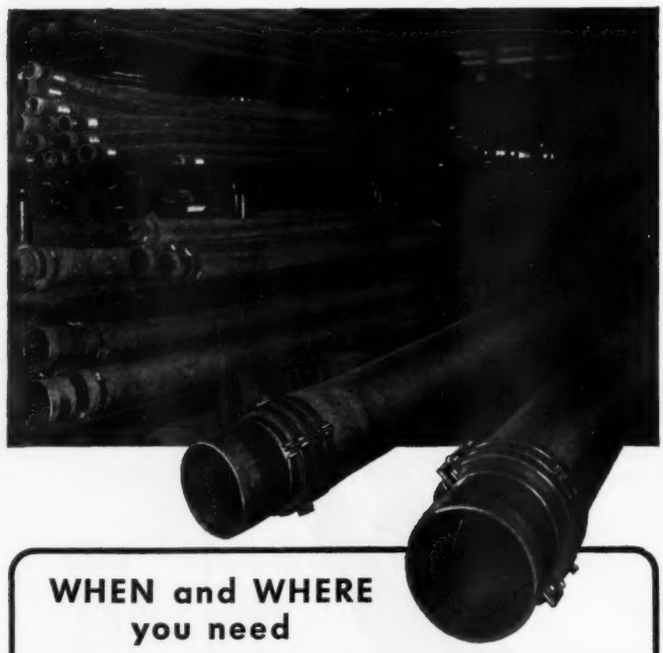
The Mattoon plant, when completed late this fall, will have a total of 200,000 square feet of manufacturing space, 35,000 square feet of space for parts and service facilities, and a 16,000-square-foot office building. It is being built as part of a $15 million integration and expansion program designed to insure better service to customers and to meet the expected increased demand for road-building equipment.

The new setup will increase the company's production capacity by a third, and this can be doubled, if necessary, without interfering with production. When the first piece of road-building machinery comes off the production line at the Mattoon plant next March, the company will have completed consolidation of manufacturing for the 22 models of equipment currently being produced at plants in Blawnox, Pa.; Nunda, N. Y.; and Elyria, Ohio.

To insure smooth production at the Mattoon plant, engineering groups are already standardizing parts and techniques used in the three plants. Altogether, the company makes two sizes each of subgraders, spreaders, finishers, base pavers, and wideners; three models of concrete pavers and Hi-Boy truck mixers; a trench roller; and three models of concrete buckets in 20 different sizes. Two operating divisions make a "paving package" which includes almost every piece of equipment needed in concrete or blacktop work on a highway.

The company, which started in the construction machinery field in 1929, will continue to emphasize new product development at the Mattoon plant. B-K last year brought out three new machines, a road widener which lays a concrete strip up to 6 feet wide without the use of forms, the PF-90 bituminous paver, and a combination of four portable cement bins

Robert McKenrick, vice president and general manager of the construction equipment division, has the job of consolidating operations of three Blaw-Knox plants into the Mattoon, Ill., facility.



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You can bank on fast delivery whenever you call *any* Continental Warehouse. They *all* carry big stocks of Suction Hose . . . many of them have both 8" and 10", ready to put on the road the minute you call.

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So the next time you need Suction Hose, or any other hose*, call or wire your nearest Continental Warehouse. You'll like the service you get.

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MEMPHIS 3, Tenn. 268 Madison Ave.
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with a 2,400-barrel capacity and twin automatic batchers. At the present time, several new machines are in the development stage.

George M. Butters, recently appointed works manager of the new division, will make his headquarters in the Pittsburgh office until the new plant is finished, as will Mr. McKenrick, manager of the division. McKenrick, who joined the company in 1927 as field service engineer, was construction machinery sales engineer and manager of the construction equipment department before he was given the job of consolidating the manufacture and sales of road building machinery.

C. W. McIntyre will be manager of the new parts and services department of the new plant.

THE END

New Diaphragm Pump Has Improved Plunger

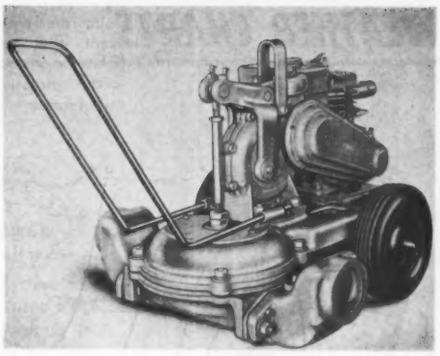
■ A diaphragm pump equipped with a variable-speed rubber-cushioned vertical-stroke plunger has been announced by Construction Machinery Co., Waterloo, Iowa. This plunger is designed to extend the service life of the diaphragm.

Called the Skwee-Gee pump, the new lightweight diaphragm model is recommended for jobs ranging from dewatering to pumping sludge. With superior priming characteristics, the pump is well suited for applications involving high suction lifts, seepage control or small wellpoint dewatering jobs. The unit operates at heads up to 40 feet.

The Skwee-Gee pump has a standard plunger stroke of 3-inches with alternate 2¾-inch stroke available by a simple adjustment. The body, valve housing, gear case, and frame of the pump are made of aluminum.

Suction and discharge connections are 3 inches in size bushed to 2 inches so that the pump may be used as either a 2-inch or 3-inch unwatering unit.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 711.



The CMC Skwee-Gee diaphragm pump features a variable-speed vertical-stroke plunger reported to increase diaphragm life. The plunger arm is rubber-cushioned to absorb hydraulic shock loads and to reduce vibration.

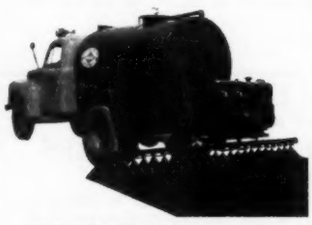
PAVING SIMPLIFIED
with CARTWRIGHT
IMPROVED
ASPHALT
DISTRIBUTOR

Precision Model with 1,250-gallon tank.

Blacktop paving contractors say that Cartwright Asphalt Distributors are better balanced, more compact, easier serviced and do a better paving job at lower cost of operation. They apply more material per day, year after year.

Manufactured in two models, equipped with Cartwright "Straight-Line" Hot Spray Bars up to 24 feet long, which are full-circulating under pressure. No nozzle drip. Patented circulating system provides balanced pressure when spraying and circulation of 300 gpm for faster heating of spray bar and nozzles. Fan pattern gives light, even application without streaks. Straight line starts and clean cut-off on straight line.

Tank capacity 600 gallons and up. Ford industrial power plant.

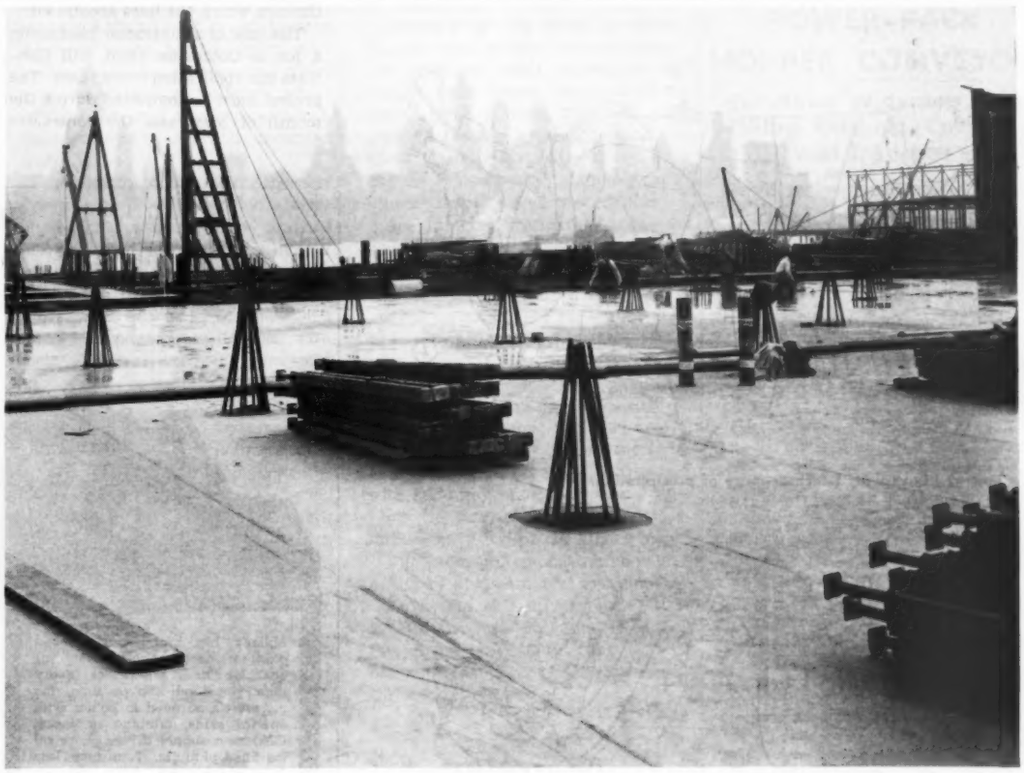


"SD" Model with 800-gallon tank.

"SD" Model is moderately priced for limited budget, has 3" pump, 12-foot spray bar, and will mount on 60" cab-to-axle truck.

Write for literature and prices.

CARTWRIGHT INDUSTRIES, INC.
P. O. Box 3251, S. Highlands Sta.
Birmingham, Alabama



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Reenforced Waterproof Paper

Because it helps produce better concrete, waterproof Sisalkraft helps you build better buildings. Because it protects concrete from "traffic damage" and debris, scuff-proof Sisalkraft assures a better job. Light in weight and easy to handle, it rolls in place easily and can be removed just as easily with minimum cleanup. It performs all the jobs of protection and curing at one low material and labor cost.

Available in rolls 3 to 13½ feet wide and blankets any width up to 26½ feet. Write for samples, application information and nearest source of supply.

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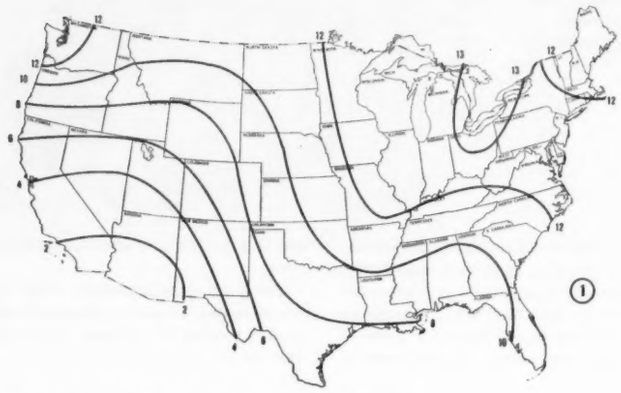

Chart 1. Days with .01 inch or more of precipitation.

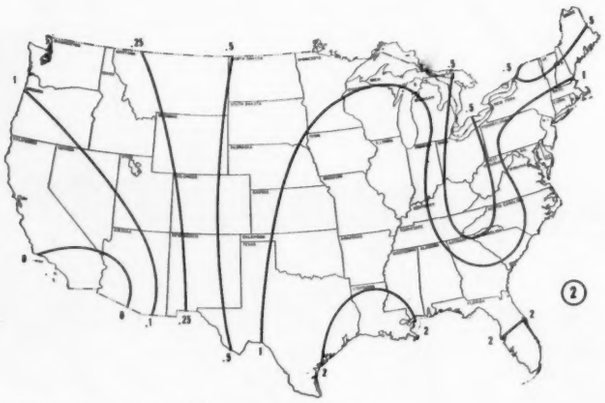

Chart 2. Days with 1 inch or more of precipitation.

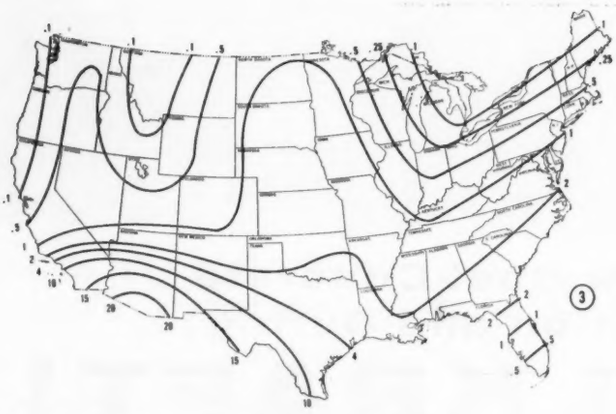

Chart 3. Days with temperatures of 90 degrees or more.

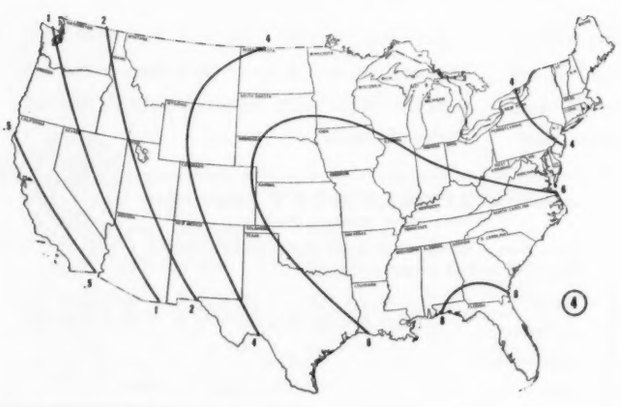

Chart 4. Days with thunderstorms.

The Weather Picture for May

Average weather conditions throughout the country during May are indicated on the accompanying maps, which show the average number of days with precipitation, temperatures of 90 degrees or higher, and thunderstorms occurring in May.

The numbered black lines indicate the average number of days on which the weather condition represented by the particular map may be expected to occur. When the number of days is given in a decimal value, such as .5, .25, or .1, it means that the condition will occur only once every 2, 4, or 10 years, respectively, in the areas through which the lines are drawn.

The case of a contractor bidding on a job in Columbus, Ohio, will illustrate the application of this data. The project must be completed during the month of May, and the contractor knows that anything more than an extremely light rain will halt his operations. The job will require 22 full working days for completion. Chart 1 tells him that, of the 31 days in the month, an average of 13 days have rainfall of .01 inch or more. That leaves him with only 18 working days, and means that the odds are against his finishing the job on time.

Weather Corporation of America, which prepares this monthly feature for *Contractors and Engineers*, emphasizes that these are not specific forecasts. Rather, they represent averages based on 60 to 80 years of May weather records at weather stations all over the country. They may be particularly helpful to the contractor in helping him determine the odds for or against his maintaining a satisfactory work schedule during the month.

PLAY IT SAFE with MILLER Tilt-Top!

Miller's big broad oak decked platform assures the safety of operator and equipment every time you load! Saves time, too ... there's no need to bother with special skids, cribbing or jacks. ONE man simply drives on or off the tilted platform. Total time, less than two minutes! Whatever you haul ... dozers, trenchers, rollers or other heavy equipment, there's a MILLER TILT-TOP to do your between-job hauling faster, safer and at less cost! See your MILLER distributor today!

Heavy D-4 dozer being loaded on Model "B" 10 ton TILT-TOP built upon the new, massive "EDG-SUPPORT" frame, now standard on all MILLER TILT-TOPS.

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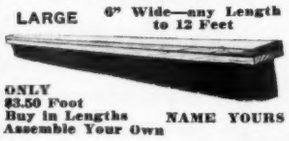
and Others - Send Your Specs

REFILLS—SPECIALISTS WITH SPRING STEEL WIRES AND FIBRES
REPAIRS - ANY MAKE SIZE OR TYPE - 24 HR. SERVICE

PECKERWOOD STEEL WIRE DRAGS

LARGE 6" Wide—any Length to 12 Feet



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SMALL
Fits Your Frame
3" Wide
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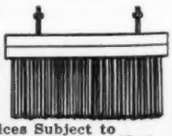
Now $2.50 ea.



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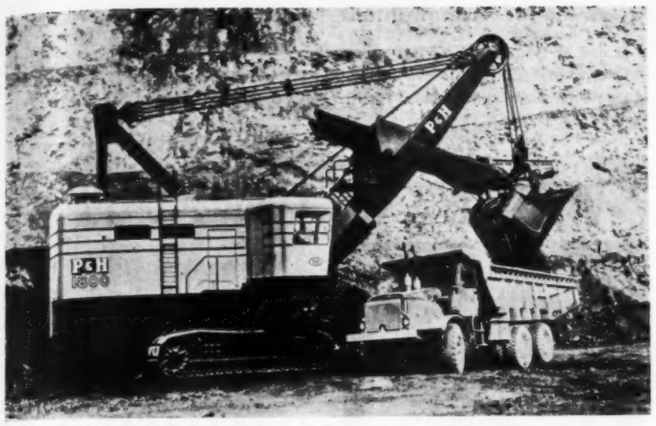

The new Model 1800, an 8-cubic-yard machine, is now the largest P&H electric shovel available.

New Electric Shovel In Large Capacity Range

■ Details have been released by Harnischfeger Corp. on its newest and largest electric shovel, the 8-cubic-yard P&H Model 1800. Innovations in this new model include P&H electronic control for all operating functions, centralized motor drive, widespread boom foot with rubber shock absorbers, and an externally-mounted propel brake.

The electronic control on the new shovel is reported to provide a more rapid signal response from controllers, allowing better coordination of shovel motions. Operation is easier with two central control consoles conveniently placed at the operator's side. The stepless controllers with their fingertip ease of movement permit the operator to work efficiently.

The Model 1800 also features Magnetorque hoist drive which transmits hoist power electromagnetically, without friction or wear.

The new shovel has a boom length of 39 feet with 24 foot dipper sticks. The machine stands 40 feet high and weighs 525,000 pounds.

For further information write to Harnischfeger Corp., Electric Shovel Division, 4617 W. National Ave., Milwaukee 46, Wis., or use the Request Card at page 18. Circle No. 710.

The Gerin meter keeps a check on the viscosity of engine lubricating oil, but indicates only those changes due to the composition of the oil, ignoring viscosity variations caused by temperature changes. ►

Meter Detects Changes In Engine Oil Viscosity

■ A new meter protects engines from wear by warning the operator when the wrong grade of lubricating oil has been used or when fuel dilution, water or anti-freeze leakage, or other factors are affecting the composition of the oil. The important feature of the Gerin meter is that it responds only to viscosity changes caused by a change in composition of the lubricating oil and ignores the normal thickening and thinning of oil due to temperature variations.

Accuracy of the meter is within one per cent, so that the instrument can measure small increments of change while having the capacity to record large changes. This makes it possible for the operator to distinguish between factors that typically change oil viscosity gradually and others that bring abrupt changes.

For further information write to The Gerin Corp., Avon, N. J., or use the Request Card at page 18. Circle No. 619.

New Folder Explains Diesel Fuel Injection

■ A folder explaining the Sheppard diesel fuel-injection system is available on request. Written in the language of the layman and illustrated with cut-away photographs and diarams, the new folder traces the steps in the operation of the fuel system.

The literature emphasizes the simplicity of Sheppard fuel injection.

To obtain this literature write to R. H. Sheppard Co., Inc., Hanover, Pa., or use the Request Card that is bound in at page 18 of this issue. Circle No. 714.

GEOLOGY in ENGINEERING

By John R. Schultz, Waterways Experiment Station, Vicksburg, Miss., and Arthur B. Cleaves, Washington University.

Written by two geologists with long experience in the daily application of geology to engineering, this work offers detailed chapters on such subjects as geologic structure, historical geology, and geologic maps and sections. The chapters on frost action in soils and aerial photographic interpretation of soils are the first reasonably complete treatments of these topics ever given in a book of this type. 1955. 592 pages. 208 illus. $8.75.

MECHANICAL and ELECTRICAL EQUIPMENT for BUILDINGS, 3rd Edition. By the late Charles Merrick Gay; Charles de Van Fawcett, Univ. of Penna.; and William J. McGuinness, Pratt Institute. Completely revised and brought up to date, with latest data on acoustical materials, supporting media, elevators, escalators, duct systems, pumps and heating. 1955. 564 pages. 327 illus. $8.50.

SIMPLIFIED DESIGN OF STRUCTURAL STEEL, 2nd Edition. By Harry Parker, University of Pennsylvania. Includes all the important, recently developed steel shapes, formulas, working stresses and design procedures, plus the significant changes that have been made in the American Institute of Steel Construction's Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings. 1955. 244 pages. Illus. $5.75.

MATERIALS OF CONSTRUCTION, 6th Edition. By the late A. P. Mills and the late H. W. Hayward. Rewritten and edited by Lloyd F. Rader, University of Wisconsin. The latest data on concrete, cement, aggregates, clay products, building stones, light-weight materials, and timber. 1955. 650 pages. 157 illus. $7.50.

ANALYSIS OF STATICALLY INDETERMINATE STRUCTURES, by John I. Parcel, Consulting Engineer, and R. B. B. Moorman, Syracuse University. The most complete account of the basic theory of deflections and statically indeterminate structures available in English today. Offers practical and authoritative coverage plus extensive tables. 1955. 571 pages. Illustrated. $9.50.

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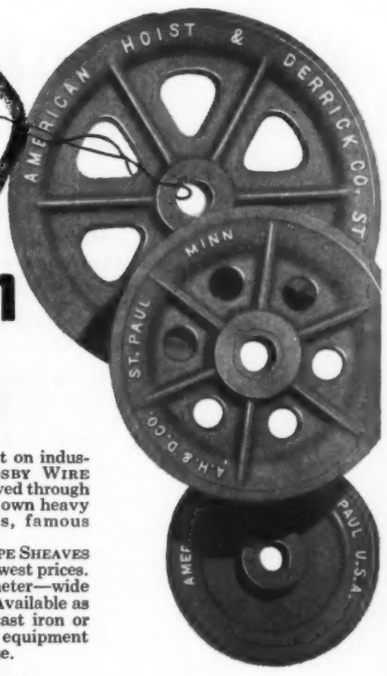

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Three Pipe Sidebooms For Crawler Tractors

■ Three Superior sidebooms introduced recently for International tractors feature a winch mounting that permits raising or lowering of the boom while the tractor is in motion.

The PBI-9A pipe boom for the TD-9 tractor has a capacity of 16,000 pounds at a 4-foot overhang and 4,900 pounds at 12 feet. The PBI-14A, which mounts on the TD-14A tractor, lifts 27,800 pounds at 4 feet and 9,000 pounds at 12 feet. The standard boom length for both of these models is 13 feet.

The PBI-18A boom, designed for the TD-18A tractor, is 16 feet long. Its lifting capacity ranges from 35,000 pounds at a 4-foot overhang to 9,650 pounds at 14 feet.

Telescopic booms available for the units provide a maximum reach of 22 feet. All three models are diesel powered and have transmissions offering four forward speeds and one reverse speed. The power-takeoff clutch is a Twin Disc unit.

The PBI-18A pipe boom is one of three new Superior sidebooms.

For further information write to The Superior Equipment Co., Box 30, Bucyrus, Ohio, or use the Request Card at page 18. Circle No. 700.

Catalog on Extensive Line Of Concrete Equipment

■ A new catalog from the Stow Mfg. Co., shows the company's complete line of concrete equipment. It presents data on electric and gasoline concrete vibrators, portable concrete grinders, gasoline and electric rotary trowels, and concrete vibrating screeds. The features of the new Model G34 Roto-Trowel with a 34-inch diameter are also discussed.

For the benefit of the contractor who wants to build his own screed using the Stow screed package assembly, complete directions as well as a drawing are included.

To obtain Catalog No. 552 write to Stow Mfg. Co., 40 Shear St., Binghamton, N. Y., or use the Request Card that is bound in at page 18. Circle No. 616.

Prime-Mover Appointment

James A. Dougan is district representative of The Prime-Mover Co., Muscatine, Iowa, for the Pacific northwest and western Canada.

Mr. Dougan was vice president of the Universal Equipment Co., Seattle, Wash., before joining the manufacturer of powered bulk-handling carts.

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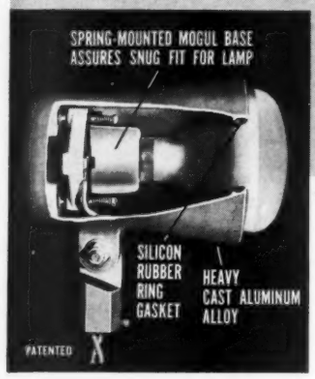

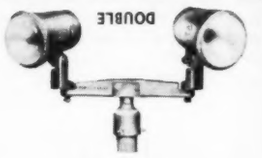

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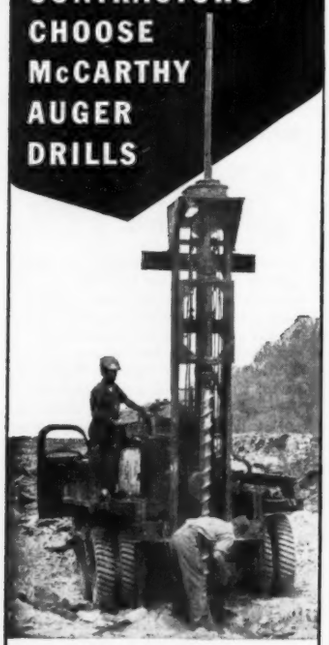

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On the Ohio Turnpike, near Windham, this McCarthy Vertical Auger Drill drills 6-inch blast holes to a depth of 18 feet at the rate of 22 holes in 8 hours.

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Patterned after the military mine detector, the Beachcomber electronic locator responds to small buried metal objects.

Electronic Detector Finds Buried Metal Objects

■ A new electronic detector has been designed specifically for locating small metal objects at appreciable depths. Operating on a principle similar to that of the military mine detector, the Beachcomber locator has an advanced circuit that supplies it with sufficient power to penetrate through earth, water, rock, ice, cement, and asphalt. The device is suitable for locating pipes, valves, electrical conduits, and similar metallic objects.

Weighing only nine pounds, the Beachcomber has simple one-knob tuning control and uses standard low-voltage batteries. Response to a metallic object is indicated through a headphone and on a meter.

For further information write to The Radiac Co., Inc., 489 Fifth Ave., New York 17, N. Y., or use the Request Card at page 18. Circle No. 613.

Executive Promotion Made by Cummins Engine

Serving as assistant general sales manager for Cummins Engine Co., Inc., Columbus, Ind., is Paul J. Every.

Prior to his present promotion, Mr. Every was responsible for the activities of the Cummins Diesel Export Corp. He has been with the company since 1947 and, as manager of regions, he was in charge of the operation of the 12 domestic Cummins regional offices and distributor activities.

Hydraulic Puller Removes Tractor Pivot Shafts

■ An addition to the Owatonna line of time and labor-saving maintenance tools is a new 100-ton Power-Twin hydraulic puller for removing and installing pivot or dead shafts on International tractors.

The tool has been designed for use on Models T-6, TD-6, T-9, TD-9, T-14, TD-14, and TD-18. The complete set includes adaptors for all of these models and provides a means of bracing the tractor A-frame to avoid distortion.

The Power-Twin hydraulic unit that powers the equipment is an integral portable unit interchangeable with other OTC puller tools used for removing and installing tractor-drive sprockets and tractor pins, etc.

For further information write to Owatonna Tool Co., 381 N. Cedar St., Owatonna, Minn., or use the Request Card at page 18. Circle No. 709.

This Owatonna puller is designed for removing and installing pivot or dead shafts on International tractors.

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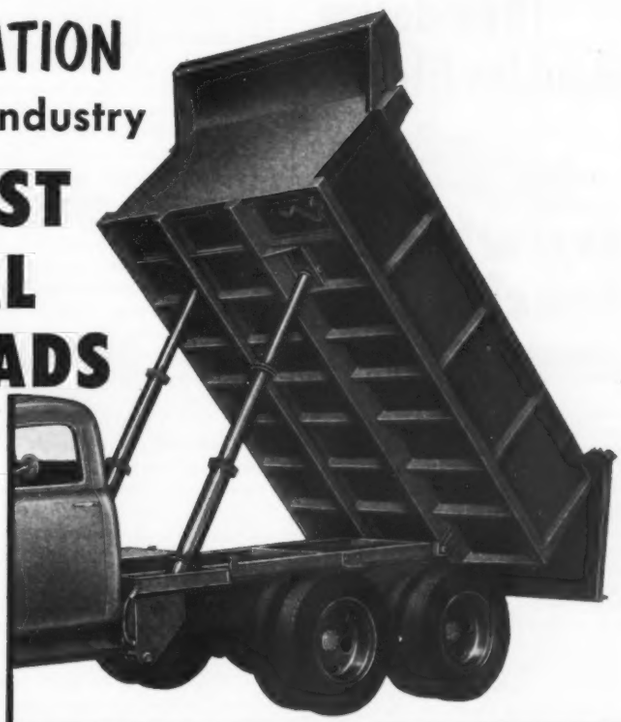
FOR BIGGEST LEGAL PAYLOADS



Anthony Teleramic Twin Telescopic hoists "in mount" models 6 to 13 ton capacities

Anthony Teleramic single cylinder hoists for single and tandem axle trucks —capacities 8 to 20 tons.

ANTHONY Teleramic HOISTS

These Telescopic Hoists let you haul up to 1,000 pounds and more *additional legal payload* on every trip. The *extreme forward* location and point of lift of these new ANTHONY Hoists shifts *all the weight of the hoist* 'way up front — *transfers more of the permissable load to the front axle* — and lets *you carry far more payload on the rear axles*. ANTHONY "Teleramic" Hoists are available for bodies 8 to 18 ft. long, in capacities from 8 to 25 tons, for all trucks — straight, 6-wheelers and semi-trailers.

With RING TRUSSED Cylinders
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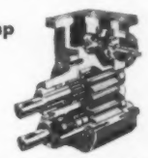
Truss rings reinforce the ends of each cylinder tube to prevent "flaring", and to adjust the packing. Extra-long bronze bearings and long overlap keeps cylinders in perfect alignment and provide extra stability and long life.

Heavy Duty *Roller Bearing* Pump



The Anthony pump on all "Teleramic" hoists is of newest "combination" design. Pump and valve are built into one housing for better control, easier servicing and longer life. Pump has finest cage type roller bearings —double shafts and replaceable bronze wearplates. Valve is positive 3-way action with auto-manual check valve.

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Manufacturers of Hoists, Dump Bodies and Lift Gates for Trucks and Semi-Trailers.

Miller SWIVELS for Blocks

As adapted to blocks, MILLER Ball Bearing Swivels prevent loads from spinning and fouling the lines. Miller Swivels turn freely under heaviest loading (capacities to 250 tons). Small Miller Swivel on dead end simplifies restringing —no line twist or kinking.

Let us work with you to adapt Miller Swivels to your particular needs.

Write for Catalog and Prices

GENERAL MACHINE and WELDING WORKS, Inc.
P.O. BOX 938 POMONA, CALIFORNIA

Use of End-Welded Studs for Curtain-Wall Construction

■ New techniques and improved equipment being used to assemble insulated metal-curtain and sandwich walls in the field are shown in a new booklet from Nelson Stud Welding Division, Gregory Industries, Inc., Lorain, Ohio.

The booklet illustrates the use of Nelson Rivweld studs that are quickly end-welded to the structural steel to secure the curtain wall. It is emphasized that with this method, shop fabrication is held to a minimum and the number of connections that must be made in the field is drastically reduced.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 670

A workman applies Scotch No. 471 pressure-sensitive plastic tape over joints of plywood forms prior to pouring concrete ceilings. The tape is designed to prevent the formation of ridges and fins. ▼

Tape Seals Joints In Concrete Forms

■ Applied by hand over plywood form joints prior to pouring, new Scotch plastic tape No. 471 is reported to prevent the formation of concrete fins and ridges. Eliminating the need for subsequent grinding, the tape also increases form re-use by preventing moisture from deteriorating the edges of the plywood. Used recently on the ceiling forms in the construction of the new Statler Hilton Hotel in Dallas, the tape was found to remove cleanly without discoloring the set concrete. The ceilings produced were in most cases smooth enough for immediate painting.

The No. 471 plastic tape is available from suppliers nationally on 36-yard rolls in various widths.

For further information write to Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn., or use the Request Card at page 18. Circle No. 610.

Concrete-Placing Buckets And Dumping Hand Carts

■ Literature showing Insley concrete equipment illustrates round-type concrete-placing buckets, ready-mix receiving buckets, and rocker-dump handcarts.

Photographs show the controlled-center-dumping mechanism of the round buckets. These are available with a narrow gate for restricted form work and with a larger gate opening for quick discharge of low-slump concrete.

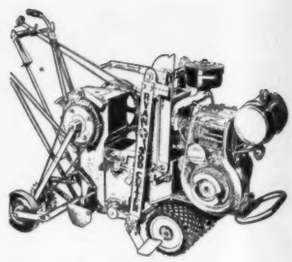
Specifications list capacities and dimensions of the equipment.

To obtain Form No. 800 write to Insley Mfg. Corp., P. O. Box 167, Indianapolis, Ind., or use the Request Card at page 18. Circle No. 677.

Improved Sod Cutter Maneuvers Easily

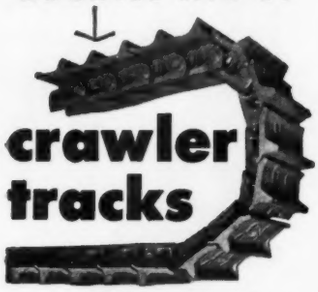
■ The Ryan Auto-Cut-Off is the latest model in the line of power sod cutters made by Ryan Landscaping Equipment Co., 871 Edgerton St., St. Paul, Minn. One-man operated, this machine will cut sod at the rate of 15 square yards per minute, automatically measuring and cross-cutting in the same operation. The length of the strip to be cut off can be preset at 1 to 9 feet.

The machine now has dual rear wheels, castered to provide easy maneuverability, that can also be locked in a straight-on position. The sod cutter also features a new free-wheeling clutch that allows the drive wheels to be disengaged for easy forward or backward movement.



For further information write to the company, or use the Request Card at page 18. Circle No. 644.

New design doubles life of



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● Please send information on crawler tracks for tractor described below. I understand I will be under no obligation.

Make of tractor_____
Model_____ No. tracks per belt_____
Width of grouser_____
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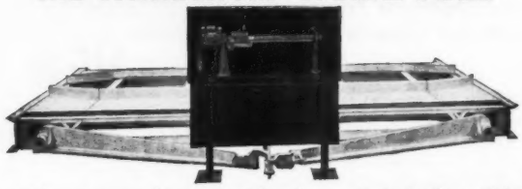

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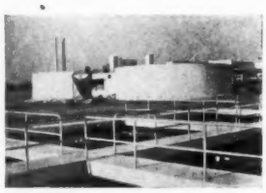

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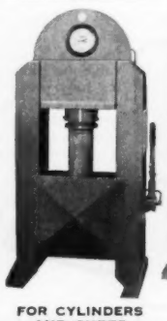
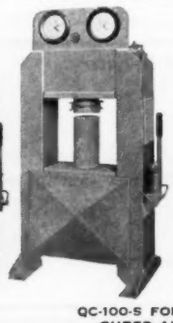


FOR CYLINDERS AND CUBES



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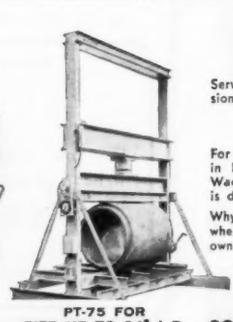

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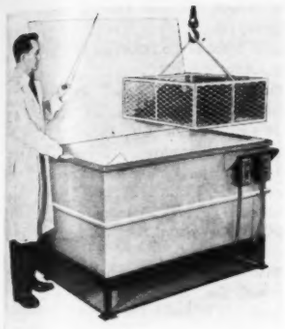

This Turbo-Blast cleaning machine holds up to 5 engine blocks at one time.

Parts-Cleaning Machine

■ An addition to the Turbo-Blast line of parts-cleaning machines has been announced by Storm-Vulcan, Inc., 2225 Burbank St., Dallas, Texas. The Model 40 parts cleaner is designed with a low loading height, which is only 40 inches from the floor.

Two parts baskets have a capacity of 3 to 5 engine blocks at one time. Cleaning time for this capacity is reported to be under 20 minutes.

The new model has a tank size of 5×3×2 feet. The tank holds up to 185 gallons of solution, which is heated by steam or gas. Two impellers are driven by two 1½-hp single-phase motors.

For further information write to the company, or use the Request Card at page 18. Circle No. 712.

Trencher Digging Wheel Has Improved Control

■ The hydraulic power system used on the recently introduced Parsons Model 150 Trenchliner for accurate control of digging depth is the chief feature covered in a new catalog describing the machine.

The digging wheel on the 150 Trenchliner travels up and down a vertical mast. A ram raises and lowers the wheel and holds close grade tolerances at any digging depth. A separate hydraulic ram tilts the mast to carry the weight of the digging wheel forward on the machine for proper balance and clearance when traveling.

The new Trenchliner is equipped to open from 12 inches to 25 linear feet of trench per minute using any of 30 digging feeds. Maximum digging depth is 5 feet 9 inches, and six digging wheel cutting widths range from 16 to 26 inches.

To obtain this literature write to Parsons Co., Newton, Iowa, or use the Request Card at page 18. Circle No. 706.

American Steel & Wire To Open Special Depot

The American Steel & Wire Division of United States Steel Corp., Cleveland, Ohio, is preparing to open a new steel warehouse at Paddock Park and Center St. in Massena, N. Y., to serve contractors working on the St. Lawrence Seaway project. Two special sales and service representatives, Edward C. Carey, Jr., and Stanley S. Williams, will work from the warehouse to handle wire rope and electrical products, respectively.

Precision-built for the man behind the gun...

Model 3000 $195.00* complete with tripod.

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HERE'S a Universal Level-Transit specially developed to handle all survey and checking operations. It's sturdy, accurate and exceptionally easy to use. And — a new single truss standard frame design replaces old-style cross bars and wyes. What's more, it has a silvered 4¼" horizontal circle and an easy to read 5 minute vernier.

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Write for Bulletin 36-C

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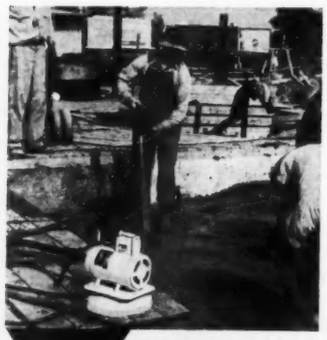

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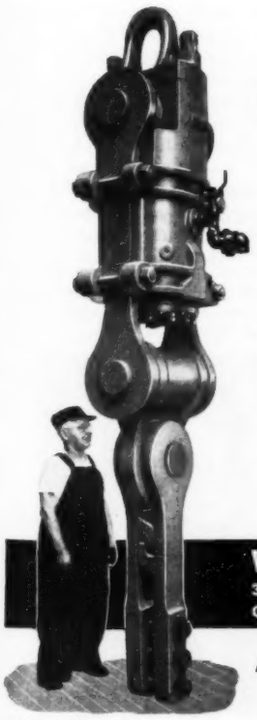

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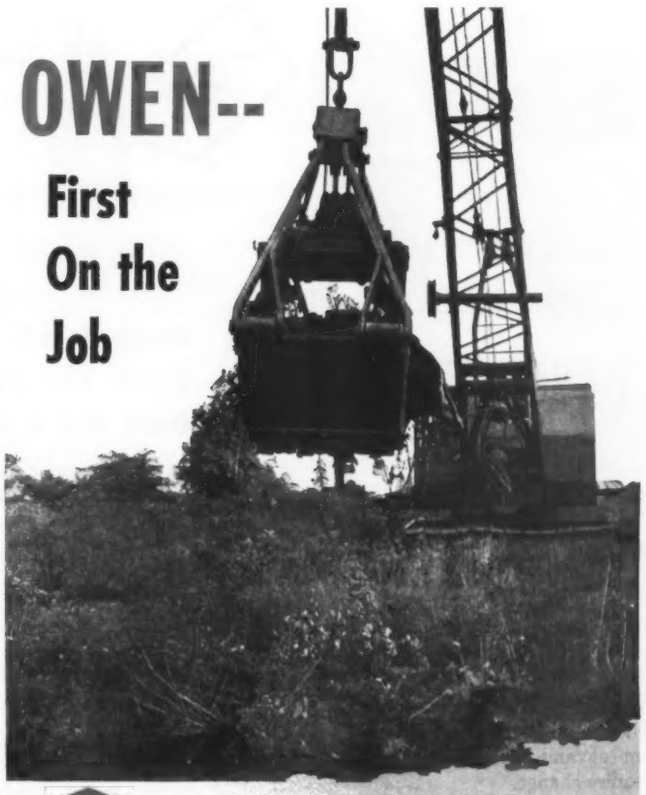

An Owen bucket takes the first bite for National Engineering & Contracting Company on the 55th Street intersection of Cleveland, Ohio's multi-million dollar freeway.

One of their many Owen buckets breaks ground for the Horwitz Co. of Cleveland, Ohio at the opening ceremonies of Ohio's 241 mile, 326 million dollar turnpike at Peninsula, Ohio.

"A mouthful at every bite"

Yes, Owen buckets are first on the job — and first in demand for those who want greater digging power, quicker opening action, and more rugged construction.

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MANUFACTURER MEMOS

Joy Vice President

Elected vice president of manufacturing by Joy Mfg. Co., Pittsburgh, Pa., is Louis G. Helmick, Jr. A graduate of Cornell University with a degree in mechanical engineering, Mr. Helmick joined Joy in 1947 as production control manager at the Franklin, Pa., plant. He will make his headquarters in Pittsburgh for the manufacturer of air compressors, drills, hoists, and generators.

The company has also made William F. Brady manager of distributor sales. Formerly New England district manager, Mr. Brady joined the company in 1940. He will now be responsible for coordinating the company's equipment distributor organization and will work out of the Pittsburgh office.

Sales and Service Manager Named by McKiernan-Terry

The new manager of pile hammer division sales and service for McKiernan-Terry Corp., New York, N. Y., is G. Robert Compton, Jr. He takes the post formerly held by the late Earle R. Evans.

G. Robert Compton, Jr., manager of pile hammer division sales and service for McKiernan-Terry Corp.

Mr. Compton, who assisted in the management of the division for a number of years, has worked closely with McKiernan-Terry distributors throughout the United States and abroad, as well as with contractors using the company's equipment.

Currently in charge of the New York City sales office, he is making his headquarters at the company's plant at Dover, N. J. The Pile Hammer Division, formerly located at 15 Park Row, New York, N. Y., is now located at the plant at 100 Richards Ave., Dover.

International Harvester Makes Personnel Changes

A former consultant in the I-H industrial power sales development section, Walter H. Tudor, has been made industrial power territory manager of the Chicago area by International Harvester Co., Chicago, Ill. He will cover Wisconsin and part of Illinois.

W. F. Hall has been named manager of the company's industrial power central sales region, which covers 16 central and midwest states. He replaces L. A. Coomer, who has been transferred to the eastern sales region.

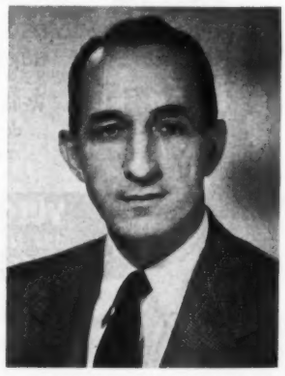
International Harvester has also established another district sales office facility in Jacksonville, Fla., to supplement the office already established there. Now one office will be responsible for motor truck sales, and the second office will take care of general sales. The latter district will be under the direction of J. P. O'Donnell, and the motor truck district office will be managed by W. K. Perkins.

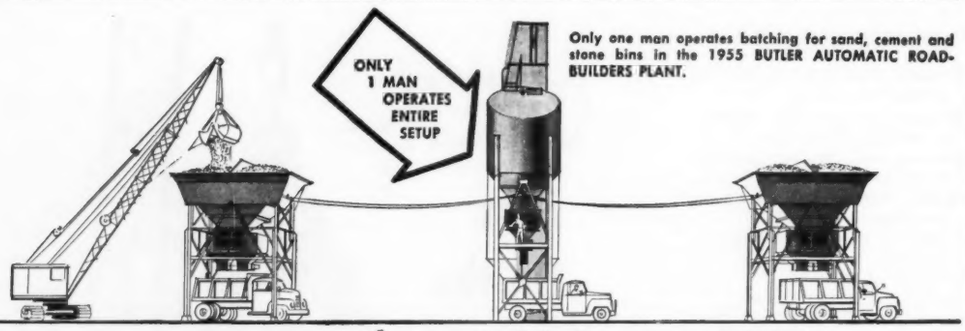
Crucible Steel Names Biggs to Manager Post

The appointment of Richard A. Biggs as product-development manager in the Stainless Division of the Crucible Steel Co. of America, Pittsburgh, Pa., has been announced. With headquarters in the Chrysler Building New York City, he will supervise the company's efforts to advise and assist customers in the full utilization of Crucible products.

Prior to joining Crucible as director of architectural development in 1950, Mr. Biggs had held positions with the Gates Rubber Co. and the Pittsburgh Plate Glass Co. For the past three and one-half years he has been a director of the Franki Foundation Co. in New York City. Active in many organizations, he is a member of the American Society for Testing Materials, the American Society of Military Engineers, and the American Society of Safety Engineers.

The new product-development manager of the Stainless Division of Crucible Steel Company of America, Richard A. Biggs.





Only one man operates batching for sand, cement and stone bins in the 1955 BUTLER AUTOMATIC ROADBUILDERS PLANT.

NEVER BEFORE . . . such high portability; such tremendous production; *ONE MAN OPERATION*

. . . IN A ROADBUILDER'S PLANT

The 1955 BUTLER ROADBUILDERS PLANT keeps pace with *TWO* 34E Pavers. High automation with push-button remote controls provide *one man operation,** to load 2 batches simultaneously from the cement, sand and stone bins. Batch discharge to the trucks can be actuated either by the truck driver or the operator. Master controls are located on the operators platform at the cement bin.

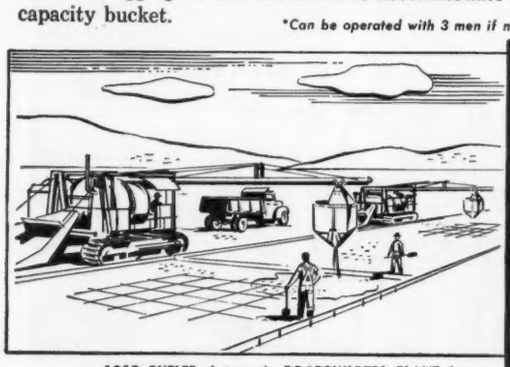
The batch combination of materials is pre-selected and pre-set and continues automatically until specifications require change.

To handle the large volume of materials for such a production flow, aggregate bins are flared to accommodate a high capacity bucket.

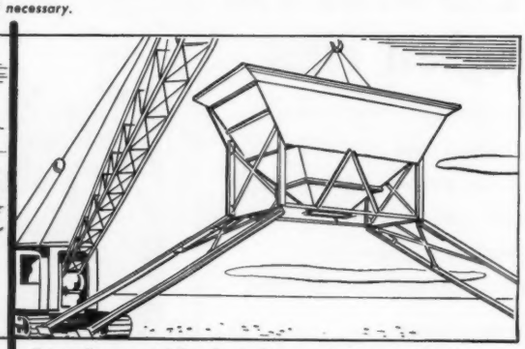
*Can be operated with 3 men if necessary.

NEVER BEFORE SUCH PORTABILITY!

For many years Butler Cement Plants have employed hinged, pin-connected columns and bracing, making them the most portable batching plants ever devised. Now Butler brings you the same structural system for your aggregate batching plants. So now the same unique Butler portability is yours in the complete Butler Roadbuilders Plant.



1955 BUTLER Automatic ROADBUILDERS PLANT keeps pace with two 34E dual drum pavers.



Extraordinary portability due to hinge and pin construction is an important cost-cutting feature of the 1955 BUTLER Automatic ROADBUILDERS PLANT.

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971 Blackstone Ave.
Waukesha, Wisconsin

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Company .....
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City ..... State .....

Write today for a complete description of this cost-slashing, labor saving, one-man operated BUTLER ROADBUILDERS PLANT. It's the difference between a highly successful season or a regretful "if I only had . . ." Use the coupon or send a postcard. But do it — now.

BUTLER BIN COMPANY
971 BLACKSTONE AVE.
WAUKESHA, WISCONSIN

General manager of the Detroit Diesel Division of General Motors Corp., Semon E. Kundsen.

Semon Knudsen Heads Detroit Diesel Division

Effective the first of last month, Semon E. Knudsen assumed the office of general manager of the Detroit Diesel Division of General Motors Corp., Detroit, Mich., succeeding the retiring William T. Crowe.

Previously, Mr. Knudsen was manufacturing manager for aircraft engine operations at the company's Allison Division. Mr. Knudsen joined General Motors in 1939 as a process engineer at the Pontiac Motor Division. He was director of the process-development section of the company before his transfer to the Allison Division in 1953.

Worthington Corp. Names New Division Executives

General manager of the newly established Harrison Division of the Worthington Corp., pump manufacturer of Harrison, N. J., is Aloysius M. Tullo. He is the former works manager of the company's main plant at Harrison.

Vice president Clarence K. Hood will be division sales manager; George F. Habach, executive engineer; Max A. Heyman, works manager; Thomas F. Quinlan, division controller; and Charles Schwalje, foundry manager.

A separate division of the corporation, the Standard Pumps Division, was founded recently at Harrison to take over all functions related to sales, engineering, and production of standard pumps. The division is headed by Vincent Gerbereux.

Harnischfeger Appoints Pacific Division Manager

The newly appointed general manager of the Pacific division of Harnischfeger Corp., Milwaukee, Wis., is Bernard Pratte. With the company since 1933, Mr. Pratte has served in a number of capacities in both the home office and in the field. In his new post, he will be responsible for distribution operations for all P&H products for eleven western states. In addition, he will take up administrative duties related to the expanding manufacturing activities at Harnischfeger's Los Angeles plant.

The company, which has purchased the patent and manufacturing rights of the Sierra Loader from the C & D Mfg. Co., Sacramento, Calif., has also announced that sales of the loader will be made by the P&H Power Crane & Shovel Division through Harnischfeger's distributors.

Ralph B. Carter Co. Appoints J. C. Droke

The new southeastern representative for the Ralph B. Carter Co., Hackensack, N. J., is J. C. Droke. He will handle sales of the Humdinger pump line and Carter irrigation pumps through construction-machinery dealers in southern Virginia, North and South Carolina, and eastern Georgia. Currently working out of Rocky Mount, N. C., Mr. Droke will eventually make his headquarters in Charlotte.

Division Sales Managers Named by Huber-Warco

Two divisional sales managers have been appointed by Huber-Warco Co., Marion, Ohio, manufacturer of a line of graders and rollers. Glenn N. Porter, will direct sales east of the Mississippi River in the United States, in the eastern half of Canada, and in Cuba.

Joseph D. Whalen will head sales activities in the western half of Canada and the United States, in Mexico, Hawaii, and Alaska.

District Manager Named For Standard Steel Office

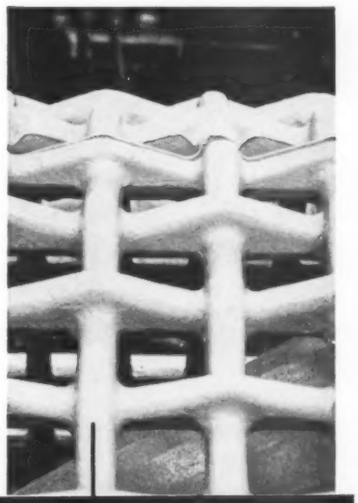
The district manager of the new southeastern district office opened in Spartanburg, S. C., by Standard Steel Works is Leonard O. Carroll. With the North Kansas City, Mo., manufacturer for a number of years, Mr. Carroll has served as purchasing agent and in the sales department.

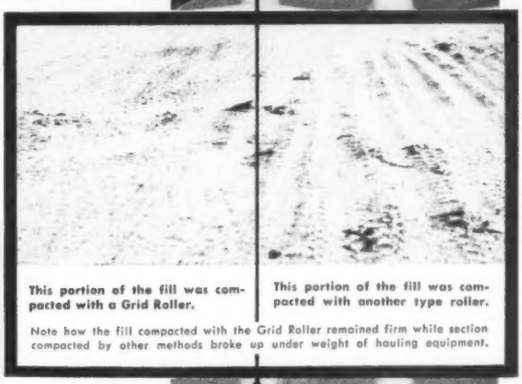
For the southeastern office, Mr. Carroll will be in charge of the distribution of the entire line of Standard Steel products. The district covers North and South Carolina, Florida, Georgia, eastern Tennessee, and eastern Alabama.

Leonard O. Carroll, manager of the Spartanburg, S. C. district office of Standard Steel Works.

"GRID® ROLLER COMPACTS MORE YARDS PER HOUR at lower cost per yard..."

...says John P. Abramson Construction Co.




This portion of the fill was compacted with a Grid Roller.
This portion of the fill was compacted with another type roller.
Note how the fill compacted with the Grid Roller remained firm while section compacted by other methods broke up under weight of hauling equipment.

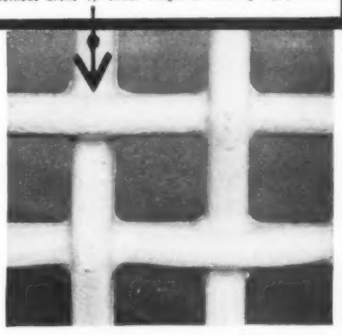
faster compaction with less fluff keeps hauling units moving at higher speeds...

"The Hyster Grid Roller is a good compaction tool because it gets required density at high speeds and leaves very little fluff. This allows our hauling units to maintain high speed coming on and leaving the fill. For these reasons, and its low maintenance cost, we are able to compact more yards per hour at a lower cost per yard," said John P. Abramson, John P. Abramson Construction Co., Des Moines, Iowa.

The Abramson outfit was working on airport runway extension fills. Material was clay-silt—difficult to compact. It came out of the borrow pit with 25% to 40% moisture with an optimum moisture content of approximately 18%.

The borrow pits were ripped with a Caterpillar ripper and allowed to dry before the material was moved. Further aerating was accomplished on the fill by discing and rolling with a sheepsfoot roller. The Grid Roller working its assigned section of the fill achieved the required density (95% modified proctor under the runway and 90% on the sides) in 6 to 12 passes. The 8-inch lifts were rolled at speeds of 10 to 15 m.p.h. with the roller weighted to 30,000 lbs.

The Hyster Grid Roller can reduce your costs on compaction jobs. See your Caterpillar-Hyster Dealer, or write Hyster Company, 2952 N. E. Clackamas Street, Portland 8, Oregon, or 1852 N. Adams Street, Peoria 1, Illinois.

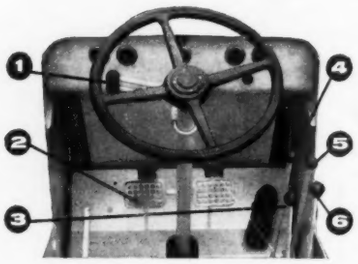


This highly efficient Grid compacts fills at higher speeds with minimum penetration and displacement of material.

HYSTER COMPANY

"Matched Design" Tractor Tools for Caterpillar-built Tractors

Faster, more power,
and LOOK, NO CLUTCH!



It's a pleasure to work here!

1. **Power-shift levers:** for Forward-Reverse and High-Low; make any shift while moving in either direction.
2. **That's no clutch!** It's a double-pedal brake, use it with either foot.
3. **Break-out bucket lever:** work the bucket in the pile—you've got two big double-acting bucket cylinders for tremendous breakout power, independent low-level tip back.
4. **Range Shift:** working or travel speed
5. **Drive Selector:** 4-wheel and 2-wheel
6. **Boom Control**

Until you see a MICHIGAN in action, you won't believe that it's possible to deliver so much power with such ease of operation. Your driver stays at peak efficiency all day long because there's no conventional clutch on a MICHIGAN. Instead, the MICHIGAN's exclusive power-shift transmission does all the shifting hydraulically—and eliminates the most notorious cause of excessive maintenance and driver fatigue.

In addition to effortless, instantaneous shifting, you get up to 300% torque multiplication on a MICHIGAN —from the Clark-built converter. With this kind of smooth, shockless power transmission, you get the full advantage of the MICHIGAN's extra weight and higher horsepower.

A demonstration (on your own job, if you wish) is the only way to get a real understanding of what this machine can do! Just write or call us—and don't forget that all MICHIGAN's are available on the low-cost MICHIGAN Lease Plan.

CLARK EQUIPMENT

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